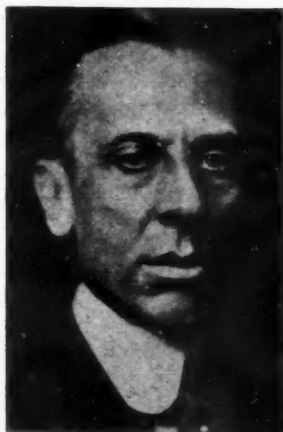


Car Sales Off In Last Two Weeks

"If necessary, industry must fight . . ."



Alfred P. Sloan, Jr.
(See page 522)

Recent Price Increases Cut Retail Demand—Production Maintained

by Athel F. Denham

Detroit Editor, Automotive Industries

DETROIT—A decline in domestic retail sales of passenger cars nationally during the last two weeks makes it appear likely that new car and truck domestic deliveries for April will not exceed 250,000 units, this representing a 10 per cent decline from previous estimates.

Unions Direct Attacks at GM Assembly Plants

Cleveland, St. Louis Shops Tied Up By Strike; Toledo Parts Plants Near Normal

DETROIT—With conditions relatively tranquil here and the MESA strike against local tool and die shops petering out, the labor battlefront shifted to Cleveland and St. Louis where strikes upset Chevrolet-Pontiac assembly operations. In addition, the possibility of trouble at Chevrolet plants in Tarrytown, Kansas City and Janesville is reported.

In Toledo, Electric Auto-Lite, Bingham Stamping & Tool Co. and Logan Gear Co. are practically back to normal operations as a result of hiring new workers, despite strikes which have been in progress at these plants for more than two weeks.

The dominant issue in the Cleveland and St. Louis strikes, which involve 10,000 and 3,000 men respectively, is union recognition, although in the former city the unions also are demanding a 30 per cent increase while the break in the

(Turn to page 510, please)

Price increases on many lines are probably the major factors contributing to the rather general decline noted. A notable exception to the trend is Ford, whose sales have been well maintained during the same period.

Scattered declines in production schedules have also been noted, but these have been offset by increases on other lines, particularly Ford, Chrysler and De Soto. Increased activity is also scheduled for Buick in preparation for announcement of its new lower-priced car.

It appears probable now that production of cars and trucks for the industry will be somewhere between two and one-half and three million units for the year (including export), an increase of one-third over last year and approximately double the 1932 volume. Factors, which have been partially taken into consideration in making this estimate, include earlier introduction this year of new models to offset the otherwise more than normal seasonal peak expected this year and the probability of further price increases, particularly on lines which have not been advanced in price as yet.

Individual company reports follow:

Buick dealers delivered 2853 in the first 10 days of April making it the best 10-day period since March, 1932, and comparing with 1397 units delivered in the first 10 days of April, 1933. 1934 Buick deliveries to April 10, total 14,840, against 11,069 last year.

Plymouth dealers retailed 7397 units in the week ended April 14, while the factory shipped 9646 units. The respective gains over the corresponding weeks last year are 121 and 110 per cent.

Buick in Production on Lower-Priced Models

FLINT—A new, lower priced line of Buick cars is scheduled for introduction in May, thus confirming rumors current for some time. Volume production of the new line has commenced and it is understood the company looks for an output of 100,000 to 125,000 units a year. The new car will be an addition to the present Buick line.

It is reported that the wheelbase will be 117 inches as compared with 119 inches for present Buick 50, and that the design will parallel that of the larger Buicks.

Feature Articles in This Issue

Car Design Trends Call for New Deal in Chassis Construction

Are Motor Trains an Automotive Engineering Job?

Engine and Fuel Problems Featured at Tractor and Industrial Power Meeting

Centralized Tool Departments Assure Keener Cutting Edges at Tool Points

Following the introduction of its new \$2,195 job, Pierce-Arrow is having the best month since April, 1931.

Hudson production exceeded the 1933 full year total on April 19.

March Production Spurt Raises Quarterly Average

WASHINGTON—A fast finish in March following a slow start in January lifted first quarter production of cars and trucks in the United States and Canada to 761,118, which is at the rate of 3,000,000 units annually. The total for the quarter was the largest for any three-month period since the second quarter of 1931, and more than double last year's output of 368,265 in the corresponding months.

March production reached 150,173, the best monthly total since April, 1931. The increase over February was 43 per cent which is substantially more than the normal seasonal expansion. Passenger car output during the month totaled 290,423, a gain of 47 per cent over February while truck production amounting to 59,750 showed an increase of 27 per cent over the preceding month.

A summary of the Census Bureau figures follows:

	March, 1934	February, 1933	March, 1933
Cars	290,423	197,381	105,812
Trucks	59,750	46,574	18,822
Total	350,173	243,955	124,634

	Three Months		
	1934	1933	Increase, Per Cent
Cars	609,103	311,576	95
Trucks	153,015	56,689	170
Total	761,118	368,265	107

Automotive Payrolls Reaching 1929 Levels

WASHINGTON—The automotive industry in March gave employment to more workers than in any month since 1929, disbursed more dollars in payrolls than in any month since May, 1930, and produced more vehicles than in any month since April, 1931.

These contributions to the nation's recovery are revealed by the indexes released monthly by the Federal Reserve Board which place March automotive employment at 96.1 per cent of the 1923-1925 monthly average, payrolls at 92.5 and production at 101 per cent. Pay per worker employed stood at 96, which when adjusted for changes in the cost of living, gave the average automotive worker in the neighborhood of 20 per cent more purchasing power than in 1929.

Average weekly earnings per worker in March, according to Labor Secretary Perkins, were \$25.70 in the automotive industry, and the wage rate in 21 establishments reporting showed an average

increase of 23.6 per cent over March, 1933.

The indexes follow:

	March, 1934	Feb- ruary, 1934	March, 1933
Production	101	71	36
Employment	96	86	44
Payrolls	92	78	27
Pay per worker ..	96	91	61
Seasonally adjusted			
Production	80	73	27
Employment	92	85	42

Graham-Paige Introduces New Eight-Cylinder Model

DETROIT—A new eight-cylinder Graham-Paige equipped with supercharger, to sell substantially below the Custom Eight, has been placed in production. The engine of the new model is the same as the Graham Eight, except that the cylinder bore has been increased from 3 1/8 to 3 1/4 inches.

Because of the stepped-up horsepower, from 95 to 135, the new model will carry a larger transmission, propeller shaft, rear axle and other vital parts.

Army Calls for New Bids On \$10,000,000 Program

WASHINGTON—New bids on practically all of the army's \$10,000,000 worth of motorized equipment will be asked following a ruling by Controller General McCarl. Mr. McCarl ruled that time limits had expired on all bids and therefore they could not be allowed to stand, despite the objection raised by some officials that to re-advertise would result in loss to the government and prices would be higher than three months ago.

Exports Gain 76 Per Cent

WASHINGTON—Combined motor vehicle exports from the United States during March, 1934, totaled 26,111 units, an increase of 76 per cent over the total of 14,802 units exported in February and 223 per cent over the 8018 units sold abroad in March, 1933, according to figures compiled in the Commerce Department's Automotive-Aeronautics-Trade Division.

50 Years Since Their Wedding Day



*Darby dear we are old and gray
Fifty years since our wedding day,
Shadow and sun for every one
As the years roll on.*

Weatherly.

Half a century ago Charles W. Nash bossed a hay-baling machine crew, Jessie Hallock was a farmer's daughter, they married. "We're still pals," says the chairman of the Nash Motor Company, and admits he and Mrs. Nash promenade the busiest boulevards holding hands. Just twice in the fifty years have Mr. and Mrs. Nash been separated for more than ten days. The last was when Mr. Nash was called to Washington to confer with President Roosevelt on the threatened automobile strike. The celebration of the golden wedding anniversary was held at the Nash hilltop home in Beverly Hills, Cal.

Revised Wagner Measure Wins Roosevelt's Support

Asks Congress to Pass It At This Session; Unemployment Reserves Also Get His O.K.

WASHINGTON—President Roosevelt has put the Wagner Labor Disputes bill as revised by members of the Cabinet on his preferred list of legislation he wants enacted at this session of Congress.

The revised bill will set up a stronger labor board than the original draft. Three types of jurisdiction are provided for: (1) the board would arbitrate cases which came before it by voluntary submissions of both parties to an argument; (2) mediation services along lines now conducted by the present board; (3) the board would issue cease and desist orders in cases where prohibited labor practices are contravened. It is reported also that the revised bill removes the ban on the initiation of employee representation plans by employers.

It is understood the reason for Mr. Roosevelt giving his support to the bill is that he wants to be rid of major strike cases being referred to him for settlement. Also it was announced here the President will support the Wagner-Lewis Unemployment Reserve measure, but will not countenance a delay in adjournment in order to secure passage of the measure, though he will agree to a two or three-day extension if necessary to get the labor bill through Congress.

W.-O. to Buy Willys Morrow Machinery

TOLEDO—Authority to sell equipment and machinery of the Willys-Morrow Co., Elmira, N. Y., not to exceed \$150,000 in amount, was given by Federal Judge George P. Hahn to the receiver, David R. Wilson of the Willys-Overland Co., this week. This wholly-owned subsidiary owes the Willys-Overland Co., \$3,500,000.

Mr. Wilson's original temporary appointment as receiver extended to June 30, has been made permanent.

Hudson Reports 1933 Loss of \$4,409,930

DETROIT—Hudson Motor Car Co. reports net loss in 1933 after taxes, charges and depreciation of \$4,409,930 against loss of \$8,459,902 in 1932.

Second and third quarter operations last year netted a small profit, but losses incurred in the first and fourth quarters, in the latter period because of production delays, caused the net loss for the year. The company made a large investment in equipment to produce its 1934 line, and while this affected its

Strikers Mill About Fisher Cleveland Plant



Strikers gather in demonstrations for 30 per cent wage increase and recognition of union

cash position, the new cars have brought greatly increased volume. By April 19, shipments this year had exceeded total 1933 shipments. Production is now averaging 1000 cars daily.

GM First Quarter Profits Near \$30,000,000 Mark

NEW YORK—General Motors earned 63 cents a share on the common stock in the first quarter of 1934, as compared with 11 cents in the corresponding 1933 period. Based on 43,500,000 shares of common, first-quarter earnings, and estimated preferred dividends, were in the neighborhood of \$30,000,000. First quarter of 1933 net earnings were \$6,870,007.

Net sales for first quarter amounted to \$205,124,080, as compared with \$120,000,163 last year. The March 31 balance sheet shows cash and marketable securities of \$153,623,975, as compared with \$135,711,686 on the same date last year. Net working capital at the close of the first quarter was \$262,543,875, as compared with \$217,468,700 on the corresponding date last year.

J. B. Siegfried Resigns

DETROIT—J. B. Siegfried has announced his resignation as general sales manager, Motor Wheel Corp., and is leaving for California shortly.

Steel Code Basing Point System Will Be Revised

WASHINGTON, April 25—"The basing point system is wrong where it is not based on the place of manufacture," General Johnson said today in connection with an announcement that the steel code would be revised in a manner that would meet the criticisms of the Federal Trade Commission. At the same time, the General characterized charges that codes foster monopoly as "bunk." General Johnson along with Messrs. Richberg and Simpson will attend a meeting of the steel code authority on April 27. It was also indicated that the steel industry was ready to make some changes in its code.

As to the Wagner Labor Disputes Bill, the General said he was opposed to it in its present form, but in its revised form it was acceptable. He also said that he was in favor of the open price association where price became effective as soon as filed.

S.A.E. Council Meets

SOUTH BEND—The S.A.E. Council met here this week at the home of past president Vincent Bendix. Present at the meeting were Messrs. Roos, president, Bendix, Brumbaugh, Kishline, Scaife, Crawford, Dickinson, Fishleigh, Newton, Fisher, Warner and Whittelsey.

Request Pro-Rated Steel Specifications

Shipping Congestion May Develop If Mills Cannot Deliver in Installments

NEW YORK—Automotive and other consumers of steel, who are holders of second-quarter contracts entitling them to lower prices on the tonnages so booked than they would have to pay now, are being urged by steel producers to so prorate their specifications that steady shipments may be made to them between now and June 30.

The Code provides cancellation of all orders when too great delay on the part of the buyer in furnishing specifications makes it impossible for the mill to make shipment within the quarter for which the business was booked. What the steel industry, especially rollers of flat steels, fears is that a good many buyers will hold off specifying until June against that portion of their contracts which is made up of the tonnages they expect to carry over into the third quarter and for which they contracted solely with a view to saving money. If these semi-speculative commitments are not so handled as to permit the mills to ship against them in approximately eight or nine weekly installments of the same tonnage extent between now and June 30, there is certain to be congestion which will inevitably cause disappointment to buyers.

Further advances in the operating rate of the steel industry were reported this week, the figures of the American Iron and Steel Institute indicating a gain of 7.3 per cent over last week, with gains in some steel districts even more pronounced. While the reported outbreaks of strikes in automotive plants cause a certain amount of uneasiness in the steel market, so far there have been no postponements of shipping orders on a serious scale. The upward revision of prices will have been completed within a few days, so that all descriptions of finished steel will be on a parity in point of price improvement.



Donald E. Bates, new president of Reo

Unions Direct Attacks at GM Assembly Plants

(Continued from page 507)

latter city, the union says, grew out of alleged discrimination against 118 union members.

Representatives of the A. F. of L. and of General Motors met separately here with the Automotive Labor Board during the week in connection with the strikes. The corporation was represented in these conferences by Charles T. and Edward F. Fisher, M. E. Coyle and Thomas Archer. Union representatives included William Collins and Frank Dillon, A. F. of L. organizers, and Charlton Ogburn, legal adviser to the Federation who came here from New York.

In addition in Cleveland, a strike of gasoline filling station attendants threatened to tie up the city's motor transportation completely.

The major issue in Toledo is the closed shop evidenced by a written contract demanded by the United Automobile Workers Federal Union No. 18,384. A 20 per cent pay increase has been asked of

Auto-Lite. Workers had two 5 per cent raises in March.

Auto-Lite reports 1296 on the payroll, or three times the number on strike. Bingham and Logan are operating two shifts, although the night crew is small. Machinists who have been on "holiday" since the strike have returned to some of the plants affected.

Violence, which marked the first few days of the strike when Communists aided the strikers in a mass picketing demonstration, disappeared after an order of common pleas court restricted pickets to 25 to each of two gates at the Auto-Lite plant and one gate at Bingham Stamping. Logan Gear did not ask for an injunction.

The Automobile Labor Board has indicated it has no jurisdiction over the automobile parts industry but offered its services if desired by both labor and employers. Several conferences, however, were held with the board by two groups of labor and the employers Monday which resulted in word from the board that no specific complaints of code violation had been made.

A petition of Auto-Lite workers signed by more than 1,100 was presented to the court the day after the picketing restriction went into effect to thank the court for the action and ask that the protection be continued.

Chevrolet Promotes Thompson and Wood

DETROIT—Expansion of the Chevrolet factory parts and service division is indicated with the appointment of two new assistants to M. D. Douglas, general parts and service manager. The new assistants are I. W. Thompson and C. W. Wood, formerly regional parts and service managers at Buffalo and St. Louis respectively. Succeeding Mr. Thompson at Buffalo is P. Eliason, while R. P. Bruner replaces Mr. Wood at St. Louis.

L. V. Bierk has been appointed zone manager at Janesville, Wis.

Tentative Studebaker Plan Submitted, Dow, Jones Say

CHICAGO—A tentative reorganization plan for the Studebaker Corp. has been submitted to creditors, according to Dow, Jones & Co. Details of the plan have not been disclosed, nor is it known how soon definite action on reorganization can be expected.

Saleswomen Run Salon in Ford Experiment

DETROIT—An automobile salon for women and run by factory-trained saleswomen is an experiment being tried by Ford Motor Co. in a Detroit department store. The saleswomen have been given an intensive training course in both sales and service at the factory.

First Quarter Statements

Vehicle Companies	1934	1933
1 company previously reported.....	+ \$15,142	— \$86,696
Auburn Automobile Co.	— 857,395 (Feb. 28)	— 577,466
Packard Motor Car Co.	— 1,257,021	— 1,131,823
Total—3 companies.....	—\$2,099,274	—\$1,795,985
Other Automotive Companies		
8 companies previously reported.....	+ \$1,176,829	—\$2,393,840
Allis-Chalmers Co.	+ 677,153	— 869,986
Bohn Corp.	+ 649,953	+ 100,602
Cincinnati Crank Co.	+ 11,243	— 36,840
Eaton Manufacturing Co.	+ 341,151	— 237,179
Stewart-Warner Corp.	+ 167,495	— 962,281
Motor Products Corp.	+ 81,125	— 147,725
Mullins Manufacutring Corp.	+ 61,549	— 126,469
Federal-Mogul	+ 35,123	— 39,000
Midland Steel Products.....	+ 70,857	— 62,903
Bendix	+ 758,977	— 267,463
Total—17 companies	+ \$2,654,633	—\$5,042,931

April 28, 1934

Automotive Industries

M.E.W.A. Issues Protest on Code Discriminations

Charges Minorities Seek to Perpetuate Unfair Practices in Supplements to APEM Code

CHICAGO—Perpetuation in product group supplements to the APEM codes of what jobbers hold to be unfair and discriminatory practices, are attacked vigorously in an open letter to manufacturers from the Motor & Equipment Wholesalers Association.

Mincing no words, the letter states, "There is a widespread opinion among jobbers that in several—perhaps most—manufacturer product groups there are some minority interests seeking to use Codes of Fair Competition as a means of perpetuating what are believed to be unfair and discriminatory practices, rather than as a means of correcting them." Continuing the letter raises the question whether such practices ultimately benefit the manufacturer and warns that their continuance will bring reprisals from wholesalers.

The attack strikes in part at practices which jobbers sought to control from another angle, through the resale price maintenance sections of their code. It will be recalled, however, that these sections were suspended pending an investigation of the alleged unfair and discriminatory methods. This investigation has been made and a report sent to NRA. So far General Johnson has not acted on the report so the price maintenance provisions are still in abeyance. What his ruling ultimately will be can only be conjectured, but the hammering NRA has been taking recently on price-fixing has served to stimulate doubts that these provisions will be approved—at least not without substantial modification.

Try This for Your Nerves

Its a Dodge 4-door Sedan leaping 8 feet in the air after climbing a 45 degree embankment in recent durability tests



The letter appears in the first issue of the M.E.W.A. Times—a new publication launched by the association as its official mouthpiece.

Ford Canadian Co. Will Ship English Firm V-8's

WALKERVILLE, ONT.—Ford Motor Company of Canada, Ltd., expects to ship between 2000 and 3000 eight-cylinder cars to England this year, according to W. R. Campbell, president. The cars will be supplied to Ford Motor Co. of London, Ltd.

The reduction of 25 per cent in the horse power tax in the United Kingdom, it is believed, will greatly increase the demand in Great Britain for Ford V-8's. The annual tax on this car is now 20 pounds, 10 shillings as compared with the former rate of 30 pounds.

Under an agreement with Ford of England the Canadian company will supply eight-cylinder cars in return for the English "Baby Ford."

Ewald Offers U. of M. \$25,000 for Adv. Course

DETROIT—Henry T. Ewald, president of Campbell-Ewald Co., advertising agency, has offered the University of Michigan \$5,000 per year for the next five years to establish a chair of advertising.

Announcement of the gift was made by G. M. Slocum, president of the Detroit Adcraft Club, at the recent dinner given Mr. Ewald. Mr. Slocum said the club would endeavor to add another \$5,000 per year to the Ewald gift for the establishment of the chair which is to be known as the "Adcraft Club of Detroit Professorship in Advertising."

President Advised Against Price Policy

WASHINGTON—The time is not yet ripe for adoption of an official price fixing policy it is understood, President Roosevelt's Cabinet Committee, appointed to study the subject, has reported. The report was not made public.

Secretaries Perkins, Wallace and Roper and Attorney General Cummings filed their report on the heels of the Darrow report, which is understood to condemn a price fixing policy. The report is said to point out that a specific determination of the part prices have played in NRA and other governmental recovery programs is impossible at the present time.

Hedner Gets Chevrolet Advertising Position

DETROIT—The appointment of Edward Hedner as assistant advertising manager of Chevrolet Motor Company, has been announced by W. E. Holler, general sales manager.

Mr. Hedner, who is one of the oldest members of Chevrolet's central office staff, in point of service, succeeds F. A. Berend, recently named advertising manager of Pontiac Motor Company.

Steel Makers Declare Increased Prices Add Little to Average Automobile Costs

NEW YORK—Increases in steel and iron prices since 1932 have added only \$3.14 to the average cost of an automobile, the American Iron & Steel Institute asserts in a booklet issued this week defending the operations of the steel industry under its NRA code.

In 1932, the Institute estimates the average cost of iron and steel used per car was \$31.41, which amounted to 5.7 per cent of the wholesale and 4.6 per cent of the retail price. Since then, it states, the cost of steel has risen 10 per cent.

Despite recent increases, steel prices are still five per cent below 1929, and 21 per cent below the 1923 post-war peak, the booklet points out. On the other hand, wage rates are 36 per cent higher

than in 1933 and 6 to 7 per cent higher than in 1929.

Reviewing the operations of employee representation plans, which have been widely adopted by the steel industry, the Institute reveals that between July, 1933, and October, 1933, 70 per cent of all matters taken up for discussion by these groups were decided in favor of the workers, 18.3 per cent against them, 7.1 per cent compromised and 4.6 per cent withdrawn.

"Any return to the destructive competitive practices of the past," the Institute concludes, "would make it utterly impossible for the industry to support the large financial burden imposed by the labor provisions of the Code."

Divided Front Axle New Bugatti Feature

**Racing Cars Also Have
Double-Reduction Rear
and Duralumin Wheels**

PARIS (By Mail)—A double-reduction rear axle, a divided front axle, and duralumin wheels and brake drums are some of the outstanding features of the new Bugatti straight-eight racing cars which made their first appearance in the Monte Carlo Grand Prix.

The engines, which have a piston displacement of 178 cu. in., have two overhead camshafts driven from the rear. The Roots-type blower, with two carbureters mounted above it, is also driven from the rear. The engine being set low in the frame, the front end of the crankshaft is opposite the front axle, and the starting crank therefore has been placed on one side and operates through the timing gears.

Like earlier Bugatti models, the front axle is forged straight, bored out and then bent to shape. The springs pass through it. On the latest model the axle is divided into halves and connected by a sleeve which allows of a slight rotary movement of one-half in relation to the other. De Ram shock absorbers are used, those at the front being mounted inside the frame, just behind the radiator.

The primary object of using a double-reduction rear axle appears to be to get a lower center of gravity by reason of the lower drive shaft. There is also the advantage that it gives greater range of gear ratios. Although single seaters are allowed, the international racing rule stipulates a minimum body width. Bugatti seats his driver to the side of the drive shaft, practically flush with it, the oil tank being on the opposite side.

The duralumin wheels and brake drums



**Code Registration Plates
All Trucks Must Display**

are of the wire spoke variety, with very thin spokes. Teeth on the wheel flange engage with corresponding teeth on the wheel rim; the spokes therefore do not have to transmit the drive, and consequently can be made much lighter than in the normal wheel construction. The brake drum, with a hard liner, forms an integral part of the wheel and, of course, is changed with it. Bugatti continues the use of shoes detachable without the use of tools. The international weight limit is 1650 lb. without tires, and the new Bugattis came inside this without difficulty.

Whitney Straight, American owner and driver of a Maserati, ran in this race with a Wilson planetary gear having pre-selective control. This is the most severe test to which gears can be submitted, for some of the cars never get into high, and the average number of changes is 12 to 15 per two-mile lap. The Wilson gear proved satisfactory and assisted in acceleration.

The race was won by Guy Moll on a straight-eight Alfa Romeo, at an average of 56.04 m.p.h. for the distance of 200 miles. Louis Chiron finished second, after leading for 198 miles.

New Proposal Made To Marmon Creditors

**American Automotive Corp.
Would Acquire Plants and
Equipment Free of Debt**

NEW YORK—Offers of rights to subscribe to stock in the American Automotive Corporation, a company organized to buy from receivers, free of debt, certain of the Marmon Motor Car Company plants, equipment and inventory, as well as the Marmon trade name, have been made to stockholders, debenture holders and open-claim creditors of the defunct company.

Under terms of the new proposal open-claim creditors and debenture holders may buy one unit of stock in the new company, consisting of one Class A share and 10 Class B shares, for each \$100 of proved claims by assignment to the new company of these claims, and of future possible dividends to be paid by Marmon receivers plus 10 cents per share in cash for each share of new stock acquired. Stockholders may acquire one unit for each 10 shares of Marmon common stock held by delivery of the latter stock to the new company and payment of \$10.10 for each share of Class A stock and 10 cents for each Class B share bought. The general public may buy new Class A stock at \$10.10 per share.

Class A stock has sole voting power and is entitled to annual dividends of 60 cents a share before any dividends are declared on the Class B stock, and thereafter shares equally with Class B shares in any further distribution.

The present offering includes 50,000 shares of Class A and 500,000 shares of Class B stocks. Approved open-claims against Marmon amount to \$235,345 and debenture holders' claims to \$1,404,024. There are 493,853 shares of common stock outstanding.

Pierce-Arrow Names Grief A. J. Chanter's Assistant

BUFFALO—The appointment of A. V. Grief as assistant to the president of The Pierce-Arrow Motor Car Company has been announced by President Arthur J. Chanter. Mr. Grief assumed the duties of his new position immediately.

The new Pierce-Arrow executive comes to Buffalo from the Pierce-Arrow Sales Corporation in New York City with which he has been associated since 1928.

Fitzgerald Advertising Account to Sun Company

TOLEDO—The Fitzgerald Manufacturing Company, Torrington, Conn., has appointed the Sun Advertising Company of Toledo to handle the advertising of its automotive division, according to an announcement by P. J. Fitzgerald, president.

Automotive Industry Affected by Third Change in Canadian Budget Tariff

OTTAWA, ONT.—The third budget tariff changes relating to the automotive industry has been announced by E. N. Rhodes, Canadian Minister of Finance. Conditions under which the items specified in the revised budget schedule are subject to drawback, and the percentage figure given in each case showing the portion of duty, not including special duty or dumping duty payable as drawback, are indicated.

Materials and Parts, n.o.p.—When used in the manufacture of goods enumerated in tariff items 438a and 438b, 60 per cent.

Materials and Parts including all materials or parts wrought into or attached thereto; engines, bodies in the white; chassis frames, hoods, plated radiator shells, splash shields, gas tank shields, gasoline feed pipes, die castings, plated or not; front and rear fenders, finished or not—When used in the manufacture of goods enumerated in tariff items 438a and 438b, 25 per cent.

(1) Provided, that no drawbacks shall hereafter be paid under this item unless at least 50 per centum of the cost of producing the finished article, not to include, after Sept. 30, 1931, duties paid upon imported materials, has been incurred in Canada; (2) Provided further, that no drawback shall be paid under this item on any of the under-mentioned articles.

To this provision is attached a long list of parts and accessories ranging from anti-squeak braids to wood parts for bodies.

The third provision of the revised schedule permits a drawback of 25 per cent on all materials and parts enumerated in Proviso 2 above when used in the manufacture of the goods listed in tariff items 438a and 438b.

The fourth provision stipulates that any claims for drawbacks accrued up to and including Sept. 30, 1931, shall be paid in accordance with the provisions of the tariff as existent on May 25, 1931. A final provision allows a drawback of 99 per cent on plate glass when used in the manufacture of safety or non-shatterable glass.

When Is Lobbying?

It's all right apparently for veterans' associations and federal office holders to put organized pressure on Congress. At least there was no outburst from "shocked" Congressmen a few weeks ago when a lobby consisting of these two groups forced passage of a "pork" bill over the President's veto.

But it appears to be all wrong for business to organize opposition to legislation which it regards as destructive of its interests. That's lobbying of the kind most shocking to Congressmen—or so it would seem from the lobbying charges directed at the opposition to the Stock Exchange Bill by Chairman Rayburn of the House Committee on Commerce.

The moral seems to be that if a lobby commands enough votes to affect the political fortunes of individual members of Congress, there can be nothing subversive to the national welfare in its activities. But a lobby that doesn't command the votes—well, that's a fair target for demagogery regardless of the justice of its contentions or the sincerity of its motives.

British Ford Co. Head Condemns Bureaucracy

LONDON, ENGLAND—The new deal and the bureaucrats it has mothered took an old fashioned spanking from Sir Percival Perry, chairman of the Ford Motor Co., Ltd., in his annual report to shareholders. Nor did Great Britain's coalition government escape Sir Percival's criticism.

"It is no ungenerous thing to say," Sir Percival stated, "that the bureaucrats who are now meddling in world affairs have very slight qualifications for their interference."

The net result of bureaucracy, the Ford Co. head continued, is curtailment of personal liberty and private enterprise.

Pennsy's Door-to-Door Service Proves Success

NEW YORK—Approximately 50 per cent of all the less-than-carload freight handled during March by the Pennsylvania Railroad was carried by the door-to-door service begun December 1, according to W. S. Franklin, vice-president.

The average daily delivery during the month was 4700, Mr. Franklin announced, with a total of 120,000 deliveries. Whether this system of handling freight will be extended to carload lots the official said was uncertain be-

cause the door-to-door delivery method is still in the experimental stage. It is estimated that about 80 per cent of carload handlings are delivered at or inside the premises of the consignee.

Mr. Franklin said the estimated new business created by the service is bringing in gross revenues greater than the drayage charges after deducting the plus charges. Consequently the officials feel the experiment is on a paying basis.

In the light of the company's experience it has been felt necessary to modify certain early provisions. The tariff has been amended so that the consignee may order delivery if the shipper fails to do so. Among some changes contemplated it is proposed to accept "order-notify" shipments which will virtually result in a c.o.d. service.

A. S. Van Halteren Joins Firestone Steel Products

AKRON—The appointment of Andrew S. Van Halteren as development engineer of Firestone Steel Products Company is announced by William A. Baker, president of that company. Mr. Van Halteren was formerly executive engineer of Motor Wheel Corporation, Lansing, Mich., having been associated with that organization for many years. In that capacity he was responsible for development of the wood, wire and steel wheels. Among the recent developments for which he is responsible is the Centrifuse Brake Drum.

Lansing Payrolls Nearing 1929 Peak

Olds and Fisher Body Co. Employment Figures Up To Level of 5 Years Ago

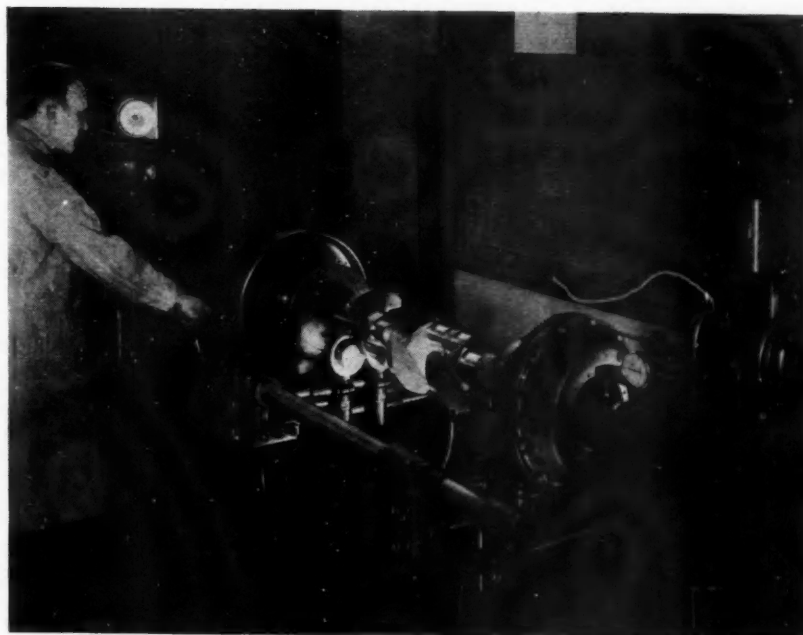
LANSING—With the Oldsmobile and Fisher Body plants employing the largest number of persons in their history, industrial payrolls in Lansing have reached the highest peak since September, 1929.

Due to a steadily increasing demand for cars, the Olds Motor Works was forced to start a night shift on the assembly line recently and this brought the total employment of the plant, exclusive of the office, to more than 5000, which compares with the previous high of 4400 in the spring of 1929.

Fisher Body employment has passed the 2000 mark here, which is at least equal to the all-time high and is two and one-half times greater than a year ago. Between 500 and 600 bodies are being produced daily with two shifts in operation.

The total industrial employment in Lansing has now passed 15,000, which compares with the all-time peak of 21,091 in April, 1929. However, belief is expressed by industrial leaders that the figure will climb to at least 18,000 before the production starts declining. They also point out that the all-time record included 2500 employees of the Durant Motor Company, now a closed issue in the industry.

Crankshaft Train Balanced as Unit



Packard balances the entire crankshaft train as a unit—shaft, flywheel, clutch and clutch-cover as this picture shows, in addition to balancing the elements individually

New Proposals Specify Weight and Performance

Uniform Laws Committee Gets Recommendations on Truck Weight and Power

NEW YORK—Definite recommendations for limitations on gross and axle weights of vehicles and minimum requirements for their performance on the highways were arrived at by a Special Subcommittee appointed by the Committee on Uniform Traffic Laws and Ordinances of the National Conference on Street and Highway Safety, which met in New York, Friday, April 20, under the chairmanship of Robbins B. Stoeckel.

The recommended gross weight for any vehicle or combination of vehicles was set according to a schedule dependent on length and ranging up to a maximum of 56,000 lb., except for units operating under special permits from the licensing authorities of the states concerned. Maximum axle weights were set at 16,000 lb. for vehicles equipped with high-pressure pneumatic tires, and 18,000 lb. for vehicles equipped with low-pressure pneumatic tires. The usual provisions that no combination of axle loads should exceed the gross weight, and no vehicle within the gross weight limit should exceed the axle loads specified, were included.

The principle was established that the performance of any vehicle should be such that it would not impede traffic, and should be able to move at a "reasonable speed" under all highway conditions normally to be encountered.

More definite indication of performance data was to be given in a note including:

It was established, however, that such performance specifications should include specifications of the following:

1. Piston displacement per 100 lb. of gross weight.

2. Ability to maintain a minimum speed on specified grade.

A plenary session of the National Conference on Street and Highway Safety will be held in Washington in May. If the report of the Special Subcommittee is adopted, the recommendations noted above will become part of the Uniform Motor Vehicle Code established for the guidance of state and local legislative bodies.

It is understood on good authority that the report of the Special Subcommittee was passed by a narrow margin, and that opponents of some of its provisions reserved the right to present a minority report to the Committee on Uniform Laws which is to meet immediately prior to the National Conference on Street Highway Safety.

Dealer Code Authority Clarifies Price Rules

Also Issues Bulletins on Drawing Accounts, Sales to Hospitals and Trading

ST. LOUIS—When prices are increased, if the manufacturer excepts from the price raise those cars for which the dealer has bona fide orders, such orders may be filled at the old prices, according to ruling issued by the National Control Committee of the Motor Vehicle Retailing Trade. On the other hand, when price increases apply to cars on order at the factory or in transit or on unfilled customers' orders, such cars must be sold at the new prices. Of course, where the customer order form does not have a clause protecting the dealer in the event of a price increase, he may be bound by contract to deliver at the old price, in which case copy of the order must be filed with the State Advisory Committee.

Another bulletin issued by the National Control Committee emphasizes that the minimum compensation paid salesmen is a drawing account and may be accumulated against the salesman as a debit until his commissions wash it out.

The Committee also has ruled that dealers may sell at a discount to hospitals supported by public subscription or endowment, and not operated for profit, thus giving effect to the recent Presidential order exempting such institutions from code price maintenance rules. In addition, the Committee has ruled that used cars may not be taken in trade at a value in excess of the Official Guide Book figure in effect on the day the dealer gets title and possession of the car.

First Chevrolet Standards Come Off the Line



Due mainly to a surprisingly large demand for Chevrolet Standards, the public introduction of these cars was delayed. Here is shown one of the Chevrolet assembly plants going full tilt on the new models

Johnson Nominated for Princeton Trusteeship

KENOSHA — Announcement from Princeton, N. J., says Courtney Johnson, Nash general sales manager, has been placed in nomination with sixteen other graduates of the university for regional trusteeship on the Board of Trustees of the institution. Mr. Johnson was graduated from Princeton with the class of 1913.

A.P.I. Schedules Papers on Automotive Subjects

NEW YORK — Automotive problems will be the topic for a session of the fourth mid-year meeting of the American Petroleum Institute, to be held at the William Penn Hotel, Pittsburgh, May 22-24, to be held on the morning of the last day of the meeting.

Among the subjects scheduled for discussion at this session are The Relation

of Fuel Octane Number and Engine Compression Ratio, by Earl Bartholomew and C. D. Hawley of Ethyl Gasoline Corp.; Conservation of Volatile-Gasoline Materials, by William Mednius and Walter Ainsley of Sinclair Refining; and Butane—A Waste Asset of the Petroleum Industry, by R. C. Alden of Phillips Petroleum. There will also be an Economic Discussion of Methods of Obtaining High-Octane Gasoline, by a speaker to be announced.

Mitchell Specialty Co. Installs New Equipment

PHILADELPHIA—Mitchell Specialty Company has recently installed modern rolling machines and is now engaged in the manufacture of a general line of metal mouldings and shapes, either in straight length or bent form and in a great variety of cross sections. The company is already in production on large volume orders.

"Code Eagle" to Perch Over Industry May 1

WASHINGTON—May 1, industry will have a new eagle to display, the "Code Eagle." General Johnson has sent a letter to all employers in all lines of industry and business notifying them that on the first of the month the familiar legend,



A sample of the new registered Blue Eagle which NRA is ready to distribute to code members

"We Do Our Part," will be discarded and in its place the word "Code" and the name of the industry, trade or business, of which the exhibitor is part, will appear.

Under the code name will be an individual registration number. Ample quantities of the insignia are to be printed and will be in the hands of State Directors within the next few days. The new banner will be distributed to code members as rapidly as their requests are received and can be cleared.

Automotive Industries

The 1,000,000th Nash Rolls Off



Officials greet car, a twin-ignition Bix Six, as it comes from the production line. Picture shows E. H. McCarty, president, standing in left foreground; James T. Wilson, vice president, directly behind head light on left; C. W. Nash, center, and Courtney Johnson, general sales manager, in right foreground. Below—The new standard Lafayette four-door, four-window sedan listing at \$645

Ainsworth Mfg. Co.

DETROIT—The Ainsworth Manufacturing Co. reports a net income of \$105,362 for the year ended Dec. 31, 1933, against a deficit of \$220,171 for 1932. Total current assets as of this date are placed at \$1,699,237, with total current liabilities of \$192,102.

Included in the current assets are cash, \$31,731; United States securities (cost), \$1,219,369; municipal securities, \$12,700; receivables, \$183,120; inventories, \$216,020, and cash value of life insurance, \$36,315. Current liabilities are accounts payable, \$169,087, and accrued wages, taxes, etc., \$23,015.

Detroit Steel Products

DETROIT—A net loss of \$29,900 making a total deficit of \$34,863 was reported by the Detroit Steel Products Co. for the year ending Dec. 31, 1933. Total current assets of the company on that date were placed at \$1,275,946 with current liabilities of \$693,234.

Current assets consisted of cash, \$117,709; bills and accounts receivable, \$506,048; marketable securities, \$27,498, and inventories, \$624,693. The current liabilities at the close of the year consisted of notes payable, \$367,650; accounts payable, \$293,247, and accruals, \$32,337.

Muskegon Specialties

MUSKEGON—Muskegon Motor Specialties Co. reports a net loss, after depreciation and other charges, for 1933 of \$55,323 against \$167,802 for 1932.

Total current assets listed on Dec. 31, 1933, were \$612,312 of which \$399,765 represented cash and government securities. Total liabilities on the same date were \$72,708.

Allied Products

DETROIT—Allied Products Corp. closed the year 1933 with a net loss of \$36,165 against \$174,006 for 1932. The 1933 net loss figure of \$36,165 is before debiting \$23,380 amortization of organization expense and \$4,189 adjustments applicable to prior years.

The company had total current assets at the close of the year of \$736,593 and liabilities amounting to \$64,756. Comprising the current assets are cash and United States securities, \$142,132; notes and accounts receivable, \$199,605; inventories, \$377,367, and cash value of life insurance, \$17,489. Liabilities listed are accounts payable, \$52,219, and accruals, \$12,537.

Federal-Mogul Corp.

DETROIT—Federal-Mogul Corp. reports a net income of \$61,606 for the year ended Dec. 31, 1933, against a deficit of \$149,868 for 1932. The 1933 report sets total current assets for the date at \$754,903, with liabilities totaling \$241,311.

Current assets included cash, \$46,439; accounts and notes receivable (net), \$218,555; inventories (at lower of cost or market), \$485,627; marketable securities (including corporate stocks at market value), \$4,282. The current liabilities consisted of bank loans, \$136,780; debentures due, \$20,000; accounts payable, \$62,901; accruals, \$10,056; Federal and Canadian taxes, \$11,575.

Briggs Manufacturing Co.

DETROIT—Briggs Mfg. Co. and subsidiary companies have reported a net profit of \$1,591,425 for the year ending Dec. 31, 1933, after all charges, including provision for federal taxes, compared with a net loss of \$4,896,422 for the previous year.

April 28, 1934

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

Despite the unfavorable weather, general business last week made a good showing; and practically all sections of the country shared in the improvement. The heavy industries continued to make gains; steel operations reached 50.3 per cent of capacity, marking a gain of 6.1 per cent; car loadings increased, and production of electrical energy exceeded that in the preceding week. Wholesale markets were active, and there was greater interest shown in fall goods. News that the Administration was opposed to inflationary measures caused breaks on the commodity markets.

Car Loadings Increase

Railway freight loadings during the week ended April 14, totaled 578,837 cars, which marks an increase of 20,950 cars above those during the preceding week, an increase of 80,655 cars above those a year ago, and an increase of 12,011 cars above those two years ago.

The Shippers' Regional Advisory Boards estimated that railway freight loadings during the second quarter of this year will be about 10.7 per cent above the actual loadings during the corresponding period last year.

Food Prices Firm

Retail food prices during the two weeks ended March 27, according to the Bureau of Labor Statistics, declined 0.4 per cent. The decline for the United States as a whole was due to a reduction of only 9 out of the 42 commodities composing the index.

Construction Jumps

According to the F. W. Dodge Corporation, the value of construction contracts awarded during March was \$179,161,500, which was almost twice the amount reported for February and three times the figure for a year ago.

Farm Wages Up

According to the Bureau of Agricultural Economics, wages of farm hands on April 1 were 20 per cent above those a year earlier.

Cotton Consumption Higher

Cotton consumed in the United States during March amounted to 618,129 bales, including linters, as against 537,564 bales during the preceding month and 550,724 bales a year ago.

Commodity Prices Dropping

Professor Fisher's index of wholesale commodity prices for the week ended April 21, stood at 73.2, as against 73.4 the week before and 73.5 two weeks before. The current figure marks the fifth successive weekly decline.

Federal Reserve Statement

The consolidated statement of the Federal Reserve Banks for the week ended April 18, shows decreases of \$3,000,000 in holdings of discounted bills, of \$4,000,000 in holdings of discounted bills, and of \$2,000,000 in holdings of government securities.

A modification of the dealer code was approved this week by General Johnson giving legal status to the acting Emergency National Committee, which has been functioning since the approval of the code, pending the selection of a permanent Code Authority as provided in the code.

Edson O. Sessions

CHICAGO—Edson O. Sessions, widely known consulting engineer, died here last Sunday. In 1926 Mr. Sessions went to Detroit and had active charge of the

building of the new power plant of the Packard Motor Car Co., the development of the Steel and Tubes, Inc., plant in Ferndale, and several other similar projects.

Mr. Sessions went to Russia in 1931 to make surveys of projected Soviet industrial enterprises. He is survived by his widow, a daughter, two sons; his mother, a sister and a brother.

Roosevelt Approves Tire Industry Truce

Cut-Throat Competition Ended by Agreement

WASHINGTON—President Roosevelt has approved the recent agreement between leading manufacturers and distributors of rubber tires setting up a 40 day truce to end price wars within the industry.

Under terms of the agreement the signatories will meet again early next week to consider an extension of the agreement unless a Code of Fair Competition is effected in the meantime.

Substantially the agreement provided for:

1. A 40-day truce effective April 3, 1934.
2. Establishment of temporary differentials below the Goodyear lists of February 9, 1934, for Sears, Roebuck & Company, Montgomery-Ward Company, Atlas Supply Company and Western Auto Supply Company.
3. Establishment of fixed trade-in allowances to prevent their use for further price cutting.
4. The discontinuance of all special rebates by manufacturers to dealers, which had been extended to enable dealers to meet destructive price cutting.
5. The discontinuance of all cut-price advertising.

Durable Goods Industries Purchasing New Equipment

CLEVELAND—The durable goods industries are indicating a more optimistic outlook and entering the market for the purchase of new machine tool equipment. For the first time in several years these important industries are beginning to replace obsolete equipment with new. This fact is shown by the report of first quarter sales of the Warner and Swasey Co., released by C. S. Stilwell, manager of sales.

During the quarter the company sold turret lathes to concerns representing 30 different industries. All but five of these may be classified in the durable goods field.

In addition, the company has exported to automobile and aviation manufacturers. Also, if the policy of the federal government of loaning money generally to the durable goods industries is actually put into effect there will be a marked and immediate improvement in the entire machine tool industry, Mr. Stilwell believes.

Dealers Meet to Prepare Budget-Assessment Plan

ST. LOUIS—All acting members of the Emergency National Committee of the Motor Vehicle Retailing Code have been invited to attend a meeting here on April 30, which is being held for the purpose of legally establishing them as permanent members of the Code Authority. The meeting will also prepare budgets by states and a plan for assessing administration costs for subsequent submission to NRA for approval.



Ben Anibal, vice president in charge of engineering, Pontiac Motor Company, gives Pontiac Regional managers a peek at next year's cars

Buses & Rails Urge 2¢ Rate Continuance

**Fair Competition Is Aim;
Southern Railway Wants
1½ Cent Basic Charge**

WASHINGTON—Continuation of the experimental basic coach fare of 2 cents per mile has been urged upon the Interstate Commerce Commission by motor bus operators and southern rail lines with the exception of the Southern Railway.

The recommendations were made to the Commission at a closed meeting and are in accordance with the NRA agreement establishing the experimental rate. Southern Railway has been operating on a 1½-cent basic rate. It was this difference between the bus operators and the railroad which brought about the inquiry before the division of the Commission headed by Commissioner Aitchison.

Appearing at the hearing as counsel for the National Association of Motor Bus Operators was Ivan Bowen, while NRA was represented by Sol A. Rosenblatt, a deputy administrator. Mr. Rosenblatt told the commissioners NRA had undertaken to stabilize the motor bus industry by its code, which was said to have increased costs of bus operators approximately \$15,000,000 annually and increasing employment by about 12,000 persons. NRA's object, Mr. Rosenblatt said, was to establish fair competition among the bus operators themselves and between the buses and railroads.

The New Orleans conference was pointed to during the hearing as a step toward creating an attitude of fair competition and the outlawing of cut-throat methods between buses and railroads. Again, it is said, the Southern Railway was the dissenter.

Representatives of the Atlantic Coast Line, Louisville and Nashville, Central of Georgia, Atlanta and West Point, Seaboard Air Line and the Southeastern Pas-

senger Association appeared at the hearing. Each representative was given an opportunity to express the views of his road. The majority of them favored the continuation of the experimental basic rate for at least another four months.

Plymouth Launches "Two-Gun" Campaign

DETROIT—Plymouth dealers are launching a factory created sales program called the "Two-Gun Campaign." It is directed specifically at owners of 1930, 1931 and 1932 Fords and Chevrolets and involves the coordination of direct mail advertising with individual salesman effort on a scale probably never before attempted nationally. Unfortunately, the full details cannot be revealed at this time.

Gasoline Prices Reached Low Ebb on First of Month

NEW YORK—Gasoline prices were at the lowest point of the year at the beginning of April with an average cost to the consumer of 18.80 cents a gallon, according to figures reported from 50 representative cities, including one from every State. The 1934 price to the motorist is still above the average for the three previous years, but that is not true of the current tank wagon price. On April, 1932, the tank wagon price was 12.40 cents a gallon, but with an average tax of 4.13 cents, the price to the consumer was only 17.30 cents. Now the average tax is 5.21 cents a gallon.

Gasoline prices on the first day of the months of 1934 and on April 1 in previous years are shown in the following table:

	Service station		Tax	Cost
	Tank exclusive	Wagon of tax		
April 1	11.95	13.59	5.21	18.80
March 1	12.76	14.05	5.21	19.26
February 1 ..	12.87	13.80	5.20	19.00
January 1	13.34	14.33	5.18	19.51
April 1, 1933..	10.19	10.92	5.15	16.07
April 1, 1932..	12.40	13.17	4.13	17.30
April 1, 1931..	11.79	13.29	3.98	17.27

Canadian Workers Celebrate

TILBURY, ONT.—Workers in the plant of Hudson-Essex of Canada, Ltd., here declared a two-minute holiday this week when 1934 production of Terraplanes and Hudsons passed the total output chalked up in 12 months' operations last year.

CALENDAR OF COMING EVENTS

SHOWS

American Transit Assoc., Cleveland, OhioSept. 22-27
Cleveland (Automotive Service Industries)Nov. 19-23

MEETINGS

American Welding Society, New York CityApril 26
U. S. Chamber of Commerce, WashingtonMay 1-4
American Petroleum Institute, PittsburghMay 22-24
National Street and Highway Safety Conference, Washington D. C.May 23-25
S.A.E. Summer Meeting, Saranac Lake, N. Y.June 17-22
American Society for Testing Materials, Atlantic City, N. J.June 25-29
American Chemical Society, Cleveland, OhioSept. 10-14
American Welding Society, New York CityOct. 1-5

RACES

IndianapolisMay 30

ANNUAL MEETINGS

National Battery Mfrs. Assoc., Cleveland, O.May 16-18
Natl. Automobile Chamber of Commerce, New York, N. Y.June 7
American Electro Platers Soc., DetroitJune 11-14
Natl. Assoc. of Motor Bus Operators, ClevelandSept. 21-22
Natl. Safety Council, Cleveland, O., Oct. 1-5

CONVENTIONS

American Gear Mfg. Assoc., Wilkesburg, Pa. (Annual)May 3-4
American Society for Metals, New York CityOct. 1-5
American Transit Assoc., ClevelandSept. 24-27
International Foundry Congress, PhiladelphiaOct. 22-26
American Foundrymen's Assoc., PhiladelphiaOct. 22-26

EXPOSITION

Natl. Exposition of Power & Mechanical Engineering (Biennial) New York, N. Y.Dec. 3-8

Car Design Trends Call for New D

by F. B. von Barenzy

Vienna, Austria

THE problem of the perfect streamline car always raises the question of a complete change in present-day chassis layouts, for a perfect streamline shape can be achieved only by placing the engine at the rear. This, of course, involves the adoption of new methods of chassis design.

There is one problem connected with the design of a perfect-streamline car, however, that has not yet been tackled, and that is the relation between chassis and body-work. In the past, these two units always have been independently developed.

Today the streamline body-builder has at his disposal a chassis construction which automotive engineers have developed without any regard to the streamline problem; they have substituted for the

orthodox construction a chassis which is safe on the road and light in weight, and which gives maximum body room for a certain overall length.

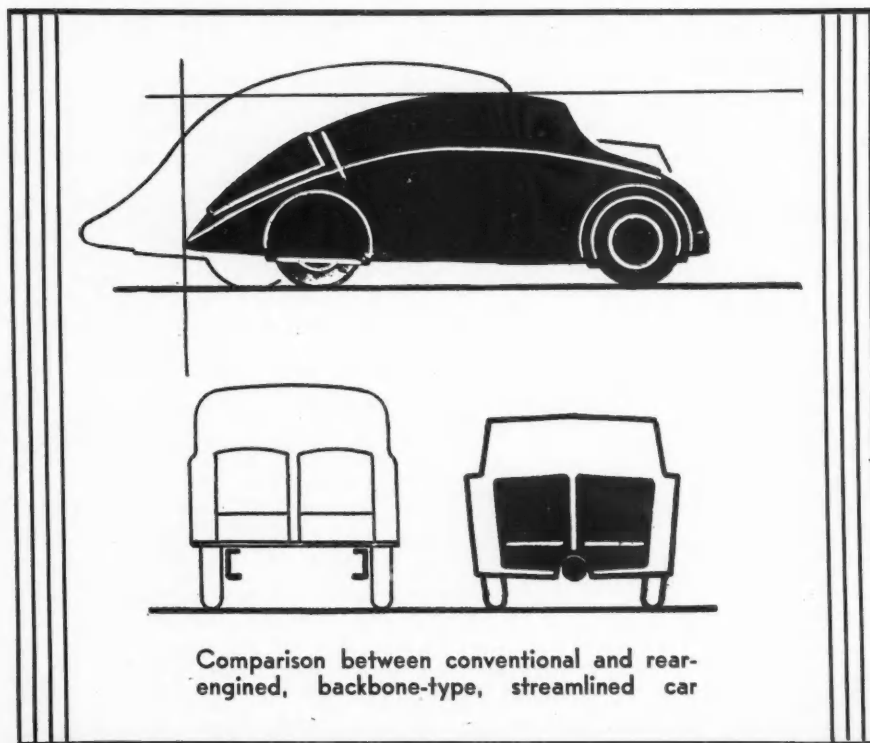
While the automotive engineer, as a rule, aims at lightness of construction for reasons of economy, the airplane engineer is compelled to design for lightness in order to produce a machine that can get off the ground. The automotive engineer particularly should derive some benefit from aerodynamic research, as it is obvious that the

experience gained in the construction of aircraft can be applied in the design of the fast wheeled vehicles.

Rumpler was the first to point the way toward perfect streamlining with his "raindrop" car. His basic idea was right; with astonishing elegance and empirical skill he applied the experience of airplane design. However, it was not nearly as simple a matter as it seemed to him. The problems of the streamline-body designer for automotive vehicles have many points in common with those of the ship designer. But in contrast to what applies in the case of the airplane, here all the phenomena of importance take place on the border-line between two media, earth and air. It is not sufficient to apply wheels to the body of an airplane of raindrop or fish-like shape and call it an automobile. Quite apart from those undesirable vortices and air eddies produced by the wheels, the slip stream would be aerodynamically perfect at best only on the upper part, while conditions in the space between the under surface of the car and the road would be quite different.

One of the first to throw light on the complicated problems of air-resistance of wheeled vehicles was Jaray. This successful student of aerodynamics came to the conclusion that a "half-drop" (or what has been described as an egg shell cut in two through its longitudinal axis) gliding along the road is the best shape for a streamlined vehicle: such a "half-

This article, which stresses the advantages of the tubular backbone over the panel-type chassis frame, is particularly timely because of the widespread adoption of independent springing, which admittedly calls for chassis structures of greater torsional rigidity. As one of the engineers active in the development of independent spring recently put it, "with



Comparison between conventional and rear-engined, backbone-type, streamlined car

Deal in Chassis Construction

this type of suspension the frames can't be too rigid." If that is the case, the tubular backbone may be the ultimate type, because a certain torsional rigidity can be obtained with much less weight in a tube of large diameter than in the conventional panel-type frame, in addition to its other advantages.

drop" encounters the least air-resistance.

Jaray then went a step further and lifted this streamline body so far from the ground that it had ground clearance enough for horizontal and vertical movement (springing). In order to inclose the rear wheels in this streamline body, he had to alter the ideal shape of a "half-drop" and adjust the pointed end of the "raindrop" to the width of the track. So Jaray's researches led to a body in the shape of a "half-drop," to the flat surface of which the chassis and the wheels are fitted, while the curved upper surface carries a fully streamlined superstructure which provides head-room for the passengers.

It is unfortunate that the kind of chassis which Jaray then had at his disposal was absolutely unsuited to the purpose, being high, overhung on all sides, and not functionally developed. Under such circumstances the matter seemed to have come to an impasse, though aerodynamically the success of Jaray's experimental car was beyond doubt. Today, however, we see that by dropping the orthodox chassis the way has been cleared for the perfect streamlined body.

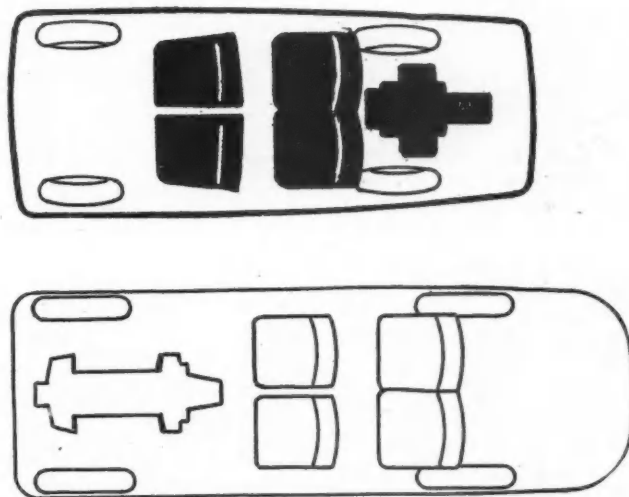
Parallel to Jaray's researches, experiments were carried out by chassis designers whose chief aim was lightness of construction. These clearly proved it necessary to bring about a complete remodelling of the orthodox chassis by dropping some of its most important principles. Step by step this

has been achieved by the introduction of new features, such as the swinging and hinged axle, a centrally placed chassis bearer instead of the usual frame, location of the engine at the extreme rear, and a low centre of gravity.

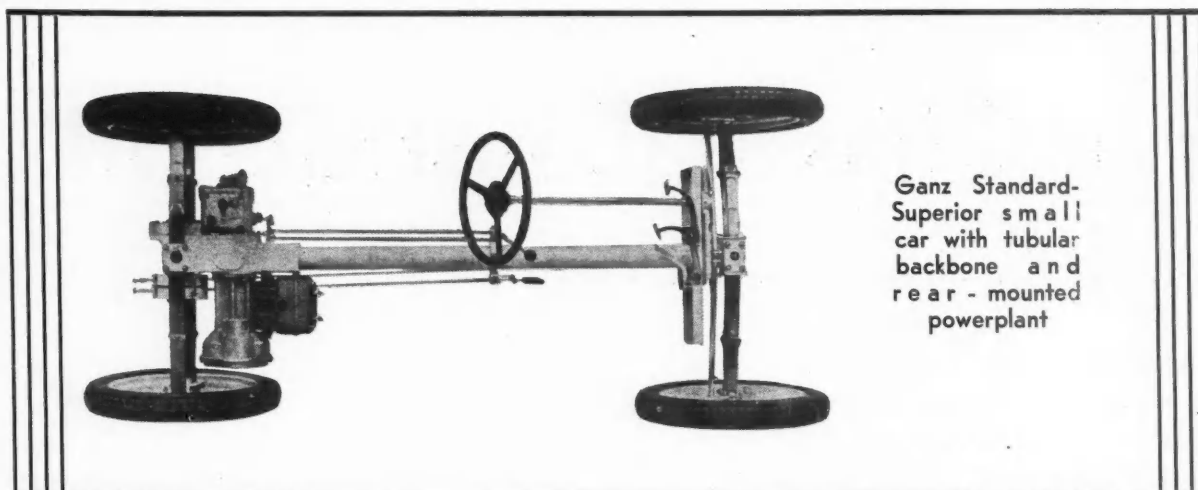
From the fact that some cars already on the market, as well as some under development, are fitted with fully streamlined bodies and superstructures, some may conclude that the basis of construction which Jaray was then seeking is now available for the construc-

tion of an aerodynamically perfect body.

We know that really satisfactory road-worthiness of a light car can be achieved only by providing the vehicle with independent points of suspension which do not influence one another. Further, vibrations must be kept down by proper weight distribution, proper springing and damping, and by locating the centre of gravity low. With very light cars this can be achieved only by independent springing, so that all four wheels always remain in contact with the road. Now, it is of little use to provide independent suspension if the frame has insufficient torsional stiffness. Such a frame would have the same effect as the rigid axle in the conventional car, so that any change in the position of the wheel would result in a corresponding change in the posi-



Comparison between conventional and rear-engined, backbone-type, streamlined car



Ganz Standard-Superior small car with tubular backbone and rear-mounted powerplant

tion of the opposite wheel and perhaps in the positions of all three other wheels. A swinging-axle car with a torsionally elastic frame behaves much worse than a good rigid-axle car, a fact which is very often pointed to as a disadvantage of the swinging axle. It cannot be denied that the body of a car fitted with swinging axles and having a frame of considerable torsional elasticity is often very badly affected.

It was for this reason that some successful builders of cars with independent suspension substituted a tubular backbone for the panel-type frame, which latter they considered unsuited under the changed conditions.

The tubular backbone chassis not only withstands strains much better, but is lighter, less costly, and results in a low center of gravity—a very important consideration. It is quite obvious that a low-built car in which all the heavier parts are at low levels offers much greater resistance to side sway due to centrifugal forces on turns, because these forces operate on shorter lever arms. A car with high center of gravity also tips forward more perceptibly when the brakes are suddenly applied; this lessens the load on the rear axle and so increases the tendency to skid. Apart from other reasons, it is a fact that the passengers are less affected by side sway the closer they are seated to the road, and the seats therefore should be located as low as possible.

Though it is quite easy to obtain a low center of gravity by using a central backbone, the design problem involves considerable difficulties, which is certainly one of

the chief reasons why comparatively few car manufacturers so far have followed the example set by Ledwinka, designer of the Tatra car, in 1920.

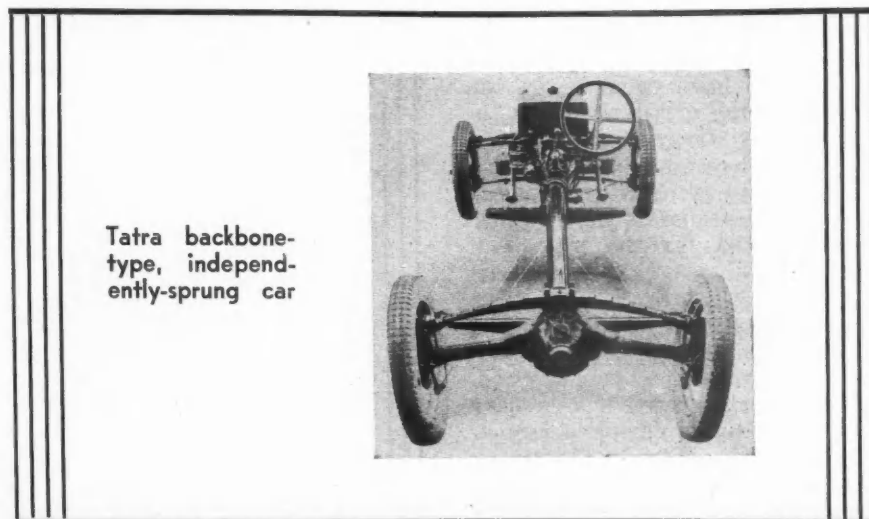
With the conventional car, ingress is interfered with by frame side rails that project above the level of the floor. With a body built around a tubular backbone chassis, strong enough to stand all torsional and warping strains, this difficulty disappears. One minor disadvantage is the central tunnel for the propeller shaft. Aside from this, the construction is functionally perfect.

In addition to the appreciable lowering of the car which resulted naturally from the adoption of the tubular backbone, it seemed desirable also to reduce the length, if that could be done without reducing comfort. There can be only one ideal seating arrangement—that which places all seats well within the wheel-base. Certain designers have abandoned the

orthodox chassis, adapted an oscillating rear axle, and moved the powerplant and drive unit to the extreme rear of the car, and in this way seem to have made a start toward solving this problem.

Many objections have been raised against the rear-engined car, and it is interesting as well as instructive to investigate these. The change in weight distribution, of course, deserves consideration. Rumpler tried to find the solution of the problem from the design point of view, but Burney 15 years later made extensive scientific researches and experiments on the effects of changes in weight distribution and in the location of the center of gravity. Since then a considerable number of rear-engine cars, all of them streamlined, have been built, and some even placed in regular production. The satisfactory results obtained with these cars are principally due to the adoption of streamlining. Thus,

(Turn to page 536, please)



Tatra backbone-type, independent-sprung car

JUST AMONG OURSELVES

Fall Announcements of New Models

NOT for a good many years have forces governing the probable announcement dates of new models been so conflicting as they are right now in 1934 when factory thinking is already being concentrated on 1935 designs.

That a general tendency toward a greater number of early fall announcements exists, is universally admitted, but that temporary forces may move many individual programs backward or forward seems to be equally evident.

Favoring early fall announcements is the favorable influence on stability of the employment curve which such announcements are believed to have. Opposing them is the need for getting sufficient quantity production from the expensive tools and dies in which many makers invested in bringing out the 1934 lines. Manufacturing interruptions and uncertainties due to labor unrest undoubtedly have pushed back the date on which a given number of units will have been built from a given set of tools and dies. Some of the more important lines are only now swinging into full stride.

Stimulating earlier announcements, on the other hand, will be the old competitive urge to get ahead of the other fellow. Undoubtedly many programs today are being kept as flexible as pos-

sible to permit quick decisions at some later date.

Without any real facts to go on, it is our guess that more companies than usual this year will be found making a fall announcement on part of their lines and following through with other models to "freshen" the line around the first of 1935.

* * *

Mooney Makes Money Clear

FINALLY we have found an explanation of monetary and currency principles and movements which really makes clear just what happens when gold standards are held to or abandoned, dollars are devaluated, international currencies fluctuate and whatnot. No greater compliment could we pay to any discussion of this subject than to say that it was clear enough to permit us honestly to understand it. Like a good many other business men, our conversation about monetary principles has been glib enough to conceal from any casual view a deep-seated confusion about the whole matter.

Fittingly enough, this clarification comes from an automotive executive—and, in the dim, distant past—a business paper editor, J. D. Mooney, president, General Motors Export Corp. By introducing a carefully and completely worked out analogy

between physical laws as exemplified by the principles of hydraulics and economic laws, he has made it possible for the non-academic mind to grasp in a few moments the sometimes complex relationships. In Part 2 of "The New Capitalism," just off the Macmillan press, Mr. Mooney succeeds admirably in providing "a means of overcoming the limitations of our minds in grappling with several factors at once and trying to hold them in place as we go on with our thinking."

In the 103 pages which comprise this section of his new book, Mr. Mooney has made a real contribution to clarification for the average business man of the principles of the most important current movement underlying all of our economic activity. We can almost guarantee that you will benefit measurably from one hour's concentration on these interesting pages.

Belief in final tying of our currency to a gold standard on some basis appears clearly to be in Mr. Mooney's mind throughout even the purely expository chapters of his book. In Part 1 he develops in picturized form for popular consumption the background of the American economic scene and in the final section, Part 3, states with characteristic vigor his own, not entirely objective, ideas of what constitutes the ideal economic America and what the leaders of various business, political and industrial groups ought to do to bring that America into being.

Both the first and the last parts have elements of real interest, but neither the simplicity of the first nor the special pleading of the third is needed to establish the middle section with its physio-economic analogies as an important contribution to the educational literature of monetary economics.—N. G. S.

WE have ample evidence that the worst of the troubles through which the world has been passing are behind us—that better times are assured, and that unless upset by some unusual circumstances improvement will continue. The rate of this improvement may be accelerated or retarded to an important degree by injecting into the picture abnormal influences, and right there arise many consequential questions of the hour.

I find myself entirely out of harmony with the thinking so prevalent that the hours of labor should be reduced to absorb our unemployment; that the number of man-hours of labor is definite and that the unemployment question is solved by dividing the number of man-hours by the number of workers. No greater fallacy exists. Around this thinking comes the proposal for a mandatory thirty-hour week. I do not believe in the principle underlying that proposal. On the contrary, I am convinced that the total amount of possible productive work in the United States can be definitely expanded with a continually improving standard of living.

No reasonable individual can disagree as to the desirability of a minimum wage; of the elimination of child labor; of a gradual reduction in the hours of labor through evolution—a reduction on an economic basis and coincident with a decline in the cost of production. On the other hand, arbitrary reductions are unsound, for, even if accompanied with a corresponding increase in the wage rate, while providing some more jobs at the moment, are bound to result in a reduction in the purchasing power of the individual worker. This is because of the resulting increase in cost with the inevitable increase in selling prices.

I have little patience with the principle that the less we produce the more prosperous we become; or again, with the widely held notion that through mass production and the instrumentality of the machine, we have reached a chronic state of overproduction. To my mind, our problem is not one of overproduction—it is one of grave maladjustment. Overproduction in general is impossible until every one who is willing to work has a least those things to which he is entitled, on the basis of the value of his work. If this be true, and I believe it is, there is no

Sloan Urges Industry to Necessary, to Fight

In frank speech, General Motors president warns against dangers of closed shop, 30-hr. week, regimentation and price fixing

overproduction of old things—and there is certainly a vast opportunity for production of new things. It is not a standardization of the processes of production that constitute our danger, but a standardization or static state of the development of our ideas.

I question whether under more normal circumstances it will be necessary or desirable to establish ways of stabilizing the price structure. The destructive influences of competition in certain industries may, however, have reached the point where something of that kind may be essential—certainly it does not apply to all industries. If anything of this kind should be essential and industry is to pay the price of the necessary control, it is absolutely vital that the standard established, whatever form it may take, be predicated on the most efficient set-ups

that exist rather than the average or a representative set-up that now forms the base in certain cases. The latter policy does nothing more or less than to perpetuate inefficiency and raise prices beyond the economic justification of same. We must keep continually in mind that to expand employment to the maximum, to restore and improve our standard of living, we must expand the purchasing power of the greatest number. But we must, at the same time, keep selling prices at the lowest economic level. This can only be done through a standard based upon the most efficient operating units, even if it necessitates the readjustment or the elimination of those that can not exist under such a standard. What is almost sure to happen, in fact it is already beginning, if we follow the present trend, is this: One industry will expand vertically and produce products now produced by another or secondary industry upon which it has been dependent—this because of the urge to establish the lowest possible cost. The result—capital diverted to the creation of productive capacity where ample capacity already exists.

Of all the problems that have arisen as the result of our efforts to promote industrial recovery, the one in which every one of us is most

The industry should produce this year at the normal trend, Mr. Sloan believes, at least 400,000 more cars and trucks than in 1933; a million more than in 1932 and an amount at least equal to 1931, viz., 2,400,000.

to Stand and, if t for a Square Deal

vitality concerned, is the new relationship between management and the worker, which has been injected into industry through "collective bargaining."

This is not because of collective bargaining *per se*, but on account of the implications that result from same. It was recognized by industry, from the inception of this idea, that in all likelihood the delicate balance between management and labor would be upset, with the result that in all probability, industrial discord on a broad scale would threaten. As to collective bargaining *per se*, it seems to me that no fair-minded individual could possibly argue as to its undesirability, either from an economic or from a social standpoint, providing the rules were fair and equitable to all concerned. I believe collective bargaining is a step forward in American industrial life, not because it sets up new rights for the worker, but because it recognizes, in a better way, old rights that have appealed to the spirit of fair play ever since the principle of representative government was imbedded in our republic.

In compliance with the provisions of the Recovery Act, many manufacturers suggested to their workers that organizations be set up to serve as an instrumentality of collective bargaining. Up to that time, except in very few isolated cases, industry has provided no such opportunity. Organizations so created have been designated as "employee representation plans" or perhaps more commonly "company unions."

A very important consideration arises in connection with the so-called "employee representation plans" and that is: Can the independence of the employee be established and maintained with respect to his relationship with his employers? Can such a plan prove effective as an instrumentality of collective bargaining, in order that it may be able to properly discharge the responsi-

bility for which it was created? The argument is centered around those points. The argument probably would not have arisen, and certainly would not be so acute, were it not for the agitation of outside unions naturally desirous of promoting their own self interests urging the claim—that they should be the instrumentality designated by the worker for the purpose of collective bargaining—that they can more effectively promote the interests of the worker.

I am convinced that from every fundamental standpoint, the real interests of both the employer and the employee can best be promoted through the route of the employee representation plan. I see no reason why, even giving weight to the criticisms of the company representation plan, it is not perfectly possible to make such an instrumentality for collective bargaining truly independent and truly effective, if industry will set about to do it. Industry can ask no more and industry should demand no less than the opportunity to proceed aggressively and earnestly in that direction, leaving it to the judgment, intelligence, experience of the American workman to decide freely, and without coercion, which route he wishes to follow.

We do not have to be very imaginative to forecast our position should industry fail to recognize and fail to aggressively deal with its responsibility in this matter. There results the closed shop. American industry would be dominated by an organization in no sense interested in the real problems between the individual employer and the individual employee, but concerned solely with the enhancement of its own selfish interests. The greatest monopoly the world has as yet seen, would be created, and all outside the law. Does the record of American industry, with its freedom and independence as developed through the

(Turn to page 535, please)

Highspots in Mr. Sloan's Speech

No greater fallacy exists than the theory that the unemployment problem can be solved by dividing the number of man-hours by the number of workers.

* * *

"I have little patience with the principle that the less we produce the more prosperous we become."

* * *

If price stabilization is essential, then the standard should be the most efficient unit, not the average or most representative set-up as is the case in certain instances now. Unless the most efficient unit is the standard, "one industry will expand vertically and produce the products now produced by another or secondary industry upon which it has been dependent."

* * *

"I believe collective bargaining is a step forward in American industrial life . . . I am convinced that best interests of both the employer and the employee can best be promoted through the route of the employee representation plan. . . . Industry can ask no more and industry should demand no less than the opportunity to progress aggressively and earnestly in that direction," leaving the choice between employee representation and outside union to the worker.

* * *

"Does the record of American history . . . justify a decision in favor of union domination? Does the history of such industries in America as are dominated by the closed shop, indicate that that is the route we should follow?"

* * *

"Is it possible to develop a procedure that will make industry self-regulating in fact, at the same time protect the equities of all concerned? Does there not loom in the shadow of this consideration the spectre of Government regulation with the implication through evolution, of Government management of industry with its stifling influence on progress?"

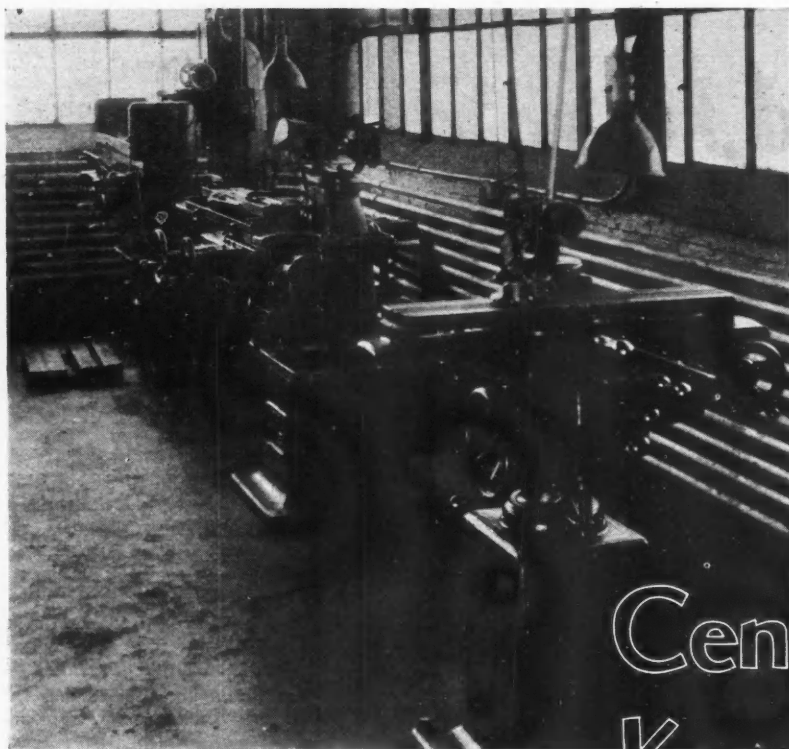


Fig. 1—Corner of P & J department tool crib at Wright Aeronautical Corp., for maintenance of fining tools

by

Joseph

Geschelin

Engineering Editor,
Automotive Industries

Centralized Tool D Keener Cutting E

THE fate of an expensive production machine, at least so far as its effectiveness is concerned, depends entirely upon the keen cutting edge of a tool point. It makes little difference whether the machine uses a single point tool or multiple tools, the success of the job still depends upon the quality of the individual cutting edge.

That's why our vote goes with those who believe that tool grinding equipment should be given as much consideration by the management as the more expensive production equipment. And, when appropriations for tool grinding equipment are considered, to look at them not as a non-productive item but as something which will guarantee the productivity of the valuable assets of the company.

A survey just completed indicates that most large manufacturing plants in the automotive industry have carried on a policy of centralized tool stores and tool grinding. Naturally this practice is not universal in the industry, particularly in the smaller industries which may be under the impression that centralized control is perhaps impractical or uneconomical for a small organization. The fact of the matter is that centralized tool control, in principle at least, can be effectively

applied in almost any organization, with large opportunities of economy and effectiveness.

As will be shown later, centralized tool grinding has many important advantages. But in the light of the facts we feel that its real objective is the control and maintenance of correct tool forms which in turn are predicated upon the use of the right kind of tool grinding equipment. We might add that the right kind of equipment implies not only the ability to produce accurate forms but to do the job quickly and economically.

Interestingly enough, our survey indicates that the introduction of cemented-carbide tools was responsible for the centralization of tool grinding and tool stores in a number of cases. The reason is obvious. Cemented-carbide tools are relatively more expensive than any other type, must be handled more carefully, and the wastage of precious material is not to be tolerated. Where a considerable volume of cemented carbide was introduced it justified the purchase of better grinding equipment which could also be used for grinding the other tools in the shop.

One of the first advantages of centralized tool grinding is the concentration of operations and equipment which makes it more economical

to buy the right kind of equipment even though it be a good deal more expensive than the simple shop grinders formerly in use.

It also makes possible full utilization of the art of chromium plating production tools. With the aid of the technique developed by the United Chromium Corp., it is possible to plate successfully the gamut of tools including drills, reamers, milling cutters, files and gages. The primary advantage is greatly increased tool life between grinds as well as an increase in the life of a tool set-up. More recently the principle has been extended to the plating of tool bodies supporting cemented-carbide tool tips. This is found to reduce the erosion of base metal, thus making the overall life of the tool quite compatible with the remarkable performance of cemented-carbide tips.

Space does not permit a detailed discussion of chromium plating as applied to cutting tools but the results of an early survey in this connection will be found in an article published in *Automotive Industries* of May 1, 1932.

Before proceeding to a general discussion of the advantages of centralized tool stores, let us consider the prime objective—maintenance of correct tool form. It is no ex-

aggeration to say that the effectiveness of costly equipment depends upon the character of the tool point presented at the surface of the work. Current machine shop research has shown conclusively that tool form directly controls not only tool life, within the possibilities of any given tool material, but also productivity and character of finish. Not only are these results sensitive to tool form and the angles at the tool tip but research work also indicates that there is only one right tool form for any given set-up. Needless to say production men and tool engineers are thoroughly acquainted with the

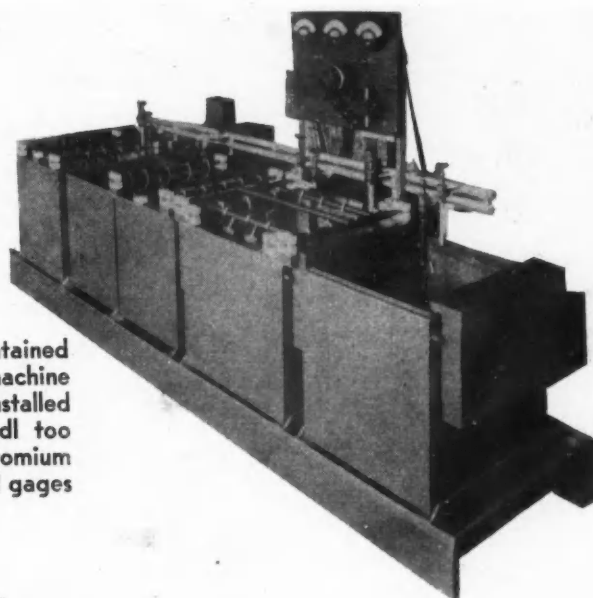


Fig. 3—Self-contained electro-plating machine which can be installed in a centralized tool room for chromium plating tools and gages

Tool Departments Assure Edges at Tool Points

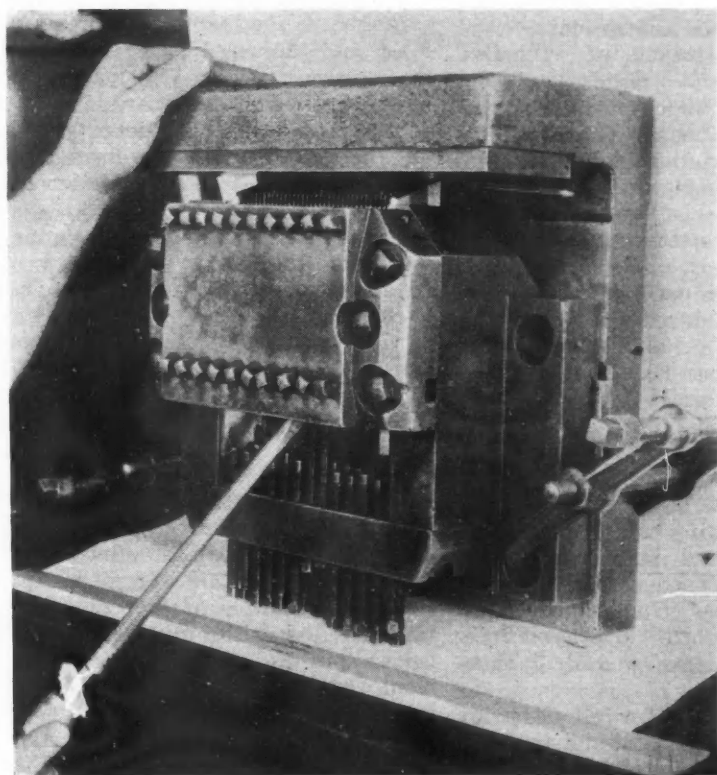


Fig. 2—Set of P & J finning tools being adjusted in tool holder after reconditioning

fact that radically different tool forms are required for the machining of materials such as aluminum, bronze, and magnesium—implying the need for maintaining these tool forms in production.

There is, therefore, a preponderance of evidence as to the necessity for maintaining correct tool forms, and many production men now believe that this control can be accomplished only through the utilization of modern tool grinding machines which embody provisions for the accurate reproduction of tool forms determined by the standards department or the tool engineer, as the case may be.

In practice centralization of tool grinding has been worked out in many ingenious ways depending upon the nature of the plant layout and operating conditions. In the main we may consider centralization simply as a management device for the complete control of all tool equipment. It implies that tool grinding will be handled in a special department set aside for that purpose and that the work will be done by one or more skilled men, depending upon the size of the plant. Centralization also implies the elimination of shop grinders in various departments and, in most plants, prohibits the grinding of tools by any machine operator.

Where the system is in use it is necessary to provide a number of duplicate sets of tools for each machine. In some cases there are only two sets, one on the machine, the other in the tool room freshly sharpened; in other instances the management provides three sets of tools, the extra set being available for emergencies such as a quick replace-

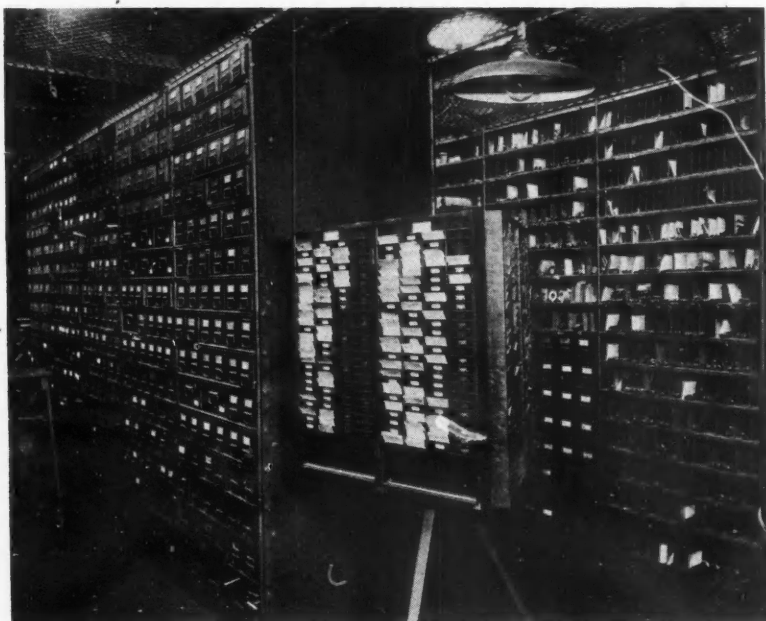


Fig. 4—View in centralized tool crib in engine department of The White Motor Co. Note small tool compartments with tool charge-out slips in each one. In the center is a rack for filing these slips numerically by clock number

ment in the event of tool breakage. In practically all cases, tools are not accepted for replacement by the tool crib if they show signs of hand grinding, thus placing the entire responsibility for maintenance squarely in the hands of the official tool grinder.

In any typical case it should be possible to set up a single tool grinding department to handle the needs of the plant, and that is substantially how it is done in many large automotive plants. Used tools are collected either hourly or daily, as the case may be, from various stations, and delivered to the tool grinding department, while fresh supplies are delivered to the machines at regular intervals so that no productive equipment will stand idle because of tool changes. There is also a single tool stores department but this may be readily supplemented by smaller cribs located in various departments.

A good example of this practice is the special tool crib, Fig. 1, in the Porter & Johnson department of the Wright Aeronautical Corp. The chief activity here is the maintenance of the finning tools used in cutting the fins in Wright engine cylinder barrels. Fig. 2 shows a set of finning tools being accurately adjusted in a master inspection fixture.

Out of the gamut of advantages resulting from the operation of centralized tool grinding we have selected the following which appear to be of controlling importance:

1. Positive control of tool design and standardization.
2. Positive control of tool maintenance.
3. All grinding done by an official operator.
4. Standardization of tool materials, thus cutting to a minimum the number of types and grades.
5. Standardization of grinding wheel grades and sizes.
6. Complete budget control of non-productive materials as exemplified by the systems used at General Motors, Timken, Studebaker and others.
7. Economies through the salvage of tool materials, gages, etc.
8. Chromium plating of tools as a standard procedure.

But any program which seeks to accomplish these fundamental economies must, of necessity, comprehend the use of the kind of equipment that can bring about these objectives. Broadly speaking, the centralized tool room must be provided with at least the following equipment, necessarily of proved performance and modern design:

1. Special tool grinders for milling cutters, hobs, form cutters, etc.
2. Drill pointing and drill thinning machines.
3. Tool grinder for single point tools capable of handling the full range of carbon steel, high speed steels, and cemented-carbides.
4. High speed cut-off machine for salvage.
5. Inspection machines and tem-

plets for checking the various types of tools.

Where the quantity of tools warrants, the department can be equipped with a self-contained chromium plating machine, Fig. 3, which can be operated by the tool crib attendant. The machine consists of five tanks supported on a single base and requires only a single connection to the power line.

For safety and comfort, the machine is provided with a ventilating system which draws off steam and fumes and exhausts them to any desired point. In addition, it will be noted that the base is really a basin with a single outlet to the sewer. Each of the tanks may be dumped through a bottom outlet while splash or drippings over the sides are also caught in the pan.

The entire unit is self-contained and mobile, thus enabling the tool department to be independent of the production plating department in the matter of job plating of every description.

Fig. 4 shows a corner of the centralized tool stores in the engine department of The White Motor Company. The plant is divided into departments each of which is provided with its own tool crib, the various cribs being served by one centrally located tool stock room where a three months' supply of standard and special tools is kept.

Orders to the main tool stores are filled and delivered twice daily by an electric truck. The main tool stores keep a daily record and inventory of usage by departments and in this manner provide a definite control and the establishment of minimum stock.

For quick reading the foregoing will give the factory executive a good picture of what may be accomplished through the establishment of the right kind of centralized tool stores; also a rough idea of the equipment needed to carry out the complete program. These points need some further elaboration because in too many cases the main objectives, namely, the maintenance of the tool point has been obscured by the other advantages which in themselves, of course, are important. If we accept the maintenance of correct tool forms as the criterion, then we can better appreciate the need for equipment that will produce the desired results quickly and economically.

The point is that if you go only part way the effectiveness of the move is rather questionable. Old obsolete machines that are incapable of producing the correct tool forms quickly and economically do not pay.

Why Some "Best Americans" Question the New Deal

by Julian Chase

Directing Editor, Chilton Co.

IN his defense of the so-called New Deal before the American Society of Newspaper Editors, Rexford G. Tugwell showed himself as the benign professor, condescending and forbearing. But partly, too, he seemed the fanatical idealist who, unconsciously discloses the intemperate hate from which his zealotry springs.

"Time will tell," he said, "which are the best Americans—those who believe that the racketeering, the financial juggling and the exploitation of workers and consumers must be ended once for all; or those who believe it more important that some insiders should be allowed to manipulate materials, natural forces and social institutions for their own good."

He asserted that "Democracy has been living a precarious life among our business institutions; its enemies in this country were in a fair way to have it strangled * * * until the New Deal came along."

Objections to the New Deal, he contended, come mostly "not from those who by their works have earned the right to speak for underprivileged men and women. They come, on the contrary, from those who represent the exploiters and the privileged, whose interest is not the country's interest but only that of the few."

Labels for Critics

These statements parallel the utterances of the Wayne Wheelers and the Bishop Cannons of the early Prohibition era. Can it be that Professor Tugwell has permitted a righteous hatred for a few malefactors to lead him into setting them up in his own judgment as representatives of our great group of industrialists and financiers? Has he fallen, as some Prohibitionists did, into the fatal error of believing that any who oppose the methods that are currently being applied to attain the noble ideals which he has expounded are opponents of those ideals and

selfish impeters of social progress?

In the hey-day of prohibition any even moderately vociferous objector was promptly tagged with the label of the "Liquor Interests." "Now," says Dr. Tugwell, "the forces of reaction are again in full cry against the New Deal" and he applies the terms "exploiters" and "privileged" to those from whom he says the greater bulk of the New Deal objections come.

Untainted Objectors

Let us say to Professor Tugwell that he is wrong. We—some of us—argued against prohibition with clear conscience and firm conviction in the justice and rightness of our cause. We advocated temperance and opposed the Prohibitionists' attempted method of attainment because we were persuaded that it would not work. We felt that we knew that men's desire for drink could not be legislated away from them any more than greed and selfishness and the propensity for chiseling can be legislated or regimented out of human nature. And we took this stand against Prohibition, Dr. Tugwell, without wages, prospective dividends, or bribes from the breweries or distilleries.

Opposition to and concern engendered by the regimentation, restrictions, conflicts and contradictions of the New Deal are found among men of unimpeachable integrity and unquestionable altruism—even among outstanding friends of the present administration. Secretary of Agriculture Wallace has pointed out that the engineers of the New Deal have failed to think things through with resulting confusion of major policies. Walter Lippman has characterized the functioning of NRA and AAA as the "Economy of Bedlam." A committee set up by General Johnson to get the views of industry as to further needs for fostering recovery has recently reported that "the great majority of

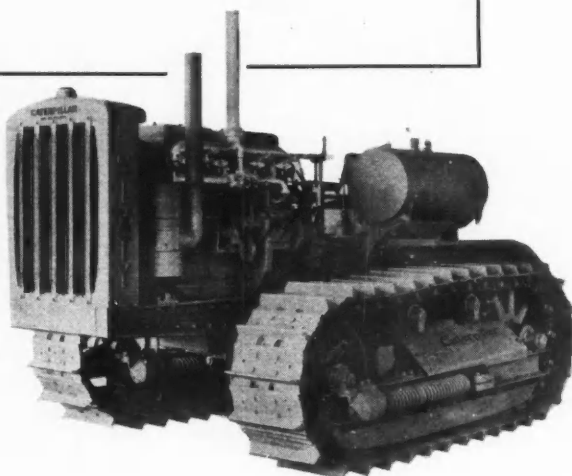
honest American business men and bankers have had imposed on them such impossible liabilities and penalties" (by the securities act) that there is an almost complete stoppage of the flow of private savings into normal investment channels. And in connection with the many legislative emergency measures of the last year, the report says, "we are gradually enforcing the nationalization of productive wealth." These men certainly are not to be classed as "reactionaries," as "exploiters" or as "privileged." Hundreds, yes thousands, of our "best Americans" join them in their doubts and apprehensions.

The New Deal is an old deal. The social and economic trends which have been picked up, appropriated and sloganized by the powers that be in Washington are as old as civilization. The New Deal started when the first two men entered a crude partnership which called for a sacrifice of selfish interest in some small degree. It has grown in force and effectiveness from that time on. To try to force the social and economic trends of which it is composed is to try what the Prohibitionists tried with temperance. That's one reason why many able, honest and unbought Americans are opposed to what today is erroneously called the New Deal. Some others, pointing to the fact that the law of supply and demand is not an act of Congress, maintain that it is a safer controller in the regulation of prices and production than laws made by politicians or young intellectuals.

To pass over the conscientious objections to the "put-em-in-jail" regimentation which is absolutely essential to the success of the NRA, it can be said that a major concern of the friends of what we have come to call the New Deal is, as Walter Lippman puts it, the unmistakable danger that some parts of it are in destructive conflict with other parts.

It is confusion of purpose, he says, that is creating resistance.

Diesel power cuts tractor fuel costs 75 to 80 per cent, H. H. Howard pointed out in his SAE Meeting paper, offsetting the higher initial cost of the compression-ignition engine



Diesel Operating Results Justify Making Higher Initial Investment

STRIKING evidence of the popularity of Diesel power among buyers of track-laying tractors was presented by H. H. Howard of the Caterpillar Tractor Co. in a paper entitled "Some Diesel Tractor Problems," which he presented at the S.A.E. Tractor and Industrial Power Equipment Meeting, held in Milwaukee last week. In the sizes in which his company offers compression-ignition engines, Mr. Howard said more than 90 per cent of the demand was for Diesels and more than 2500 tractors equipped with this type of power plant have been sold during the 2½ years Caterpillar has been offering it.

Diesel-engined tractors at present cost slightly over 30 per cent more than equivalent gasoline tractors (\$6,500 for a 75-hp. chain-track Diesel tractor as compared with \$4,750 for a 70-hp. gasoline tractor; \$4,500, as compared with \$3,400 for 50-hp. tractors, and \$3,150, as compared with \$2,400 for 35-hp. tractors), and this difference in first cost, Mr. Howard pointed out, must be justified by the higher operating economy of the Diesel. In most track-type tractor work the load factor is between 50 and 60 per cent, and this relatively low load factor is entirely in favor of the Diesel, which maintains its fuel economy much better at reduced load. The fuel consumed in doing a certain job is usually about 50 per cent less in the case of the Diesel, and the saving

on fuel cost amounts to between 75 and 80 per cent.

On a Mississippi levee construction job cited by Mr. Howard, where gasoline costs 14 cents and Diesel fuel 4½ cents per gallon, the daily fuel costs were \$16.95 and \$2.97 respectively, equivalent to a saving of \$13.97 per day and \$2,095.50 for a year of 150 working days. The subject of the relative cost of fuel and oil for a Diesel and a gas tractor was further illuminated by tabulated results of tests made at the Montana Experiment Station. In these tests, in which a Caterpillar Diesel 50 was operated on the 3000-acre farm of the station for 616.15 actual operating hours in one year, it saved just over \$700 on fuel, according to the record.

By standardizing on a single cylinder size, 5¼ x 8 in. with a 15½ to 1 compression ratio, for the three, four and six-cylinder engines which the company installs in its different size tractors, research has been simplified, manufacturing economies effected and field service facilitated. Engines are of the four-cycle, solid-injection, precombustion-chamber type. The compression pressure is 525 lb. per sq. in. and the maximum combustion pressure, 725 lb. These are moderate pressures, and, so far, no engines have blown up or been broken up, nor have there been any cases of high maintenance expense that could be traced to high gas pressures.

Engine and Fuel Tractor and In

Fuel injection pumps and valves are made interchangeable, and field adjustment, calibration and timing of these units is entirely eliminated. Any valve or pump can be installed on any cylinder of any engine, and these units are being kept in stock by dealers. Worn units are replaced by new ones on a flat-rate basis. Through the experience gained in servicing these tractors, a number of changes have been made in the valve and pump that resulted in improved performance.

Putting a new pump or valve on an old engine is said not to unbalance the engine. At first it was thought that the power outputs of individual cylinders would have to be checked from time to time, and the early engines were provided with exhaust-manifold plugs to accommodate a portable pyrometer for determining the exhaust temperature. But this proved entirely unnecessary.

Instruction books contain simple instructions for testing the complete fuel system. By jacking each pump individually by hand, the operator can quickly determine the condition of the system. A complete set of pumps and injectors on a six-cylinder engine can be installed in half an hour, and as these parts are kept in stock by dealers, serious delays are rarely occasioned by fuel-system troubles.

The chief difficulty in connection with fuels has been sufficiently to impress users that they must use a fuel that is heavy enough to assure proper lubrication of the pump, and to keep the fuel clean. Education, however, is solving the problem. In this connection the author pointed out that the automotive Diesel engine must not be allowed to become unduly sensitive with respect to the fuels that it will burn satisfactorily, as special fuels usually are expensive, and this would rob the Diesel of part of its advantages. The self-ignition temperature is of little importance, as far as the author's experience goes, with engines operating at up to 1000 r.p.m., for he has not yet found a fuel that such an engine would not run on.

Tractor engines usually are started only once or twice a day, and for this reason a sure start is much more important than a quick start. The use of any external source of heat (torch,

Fuel Problems Featured at Industrial Power Meeting

cartridge, punk, lamp) is undesirable, on account of the service requirements of these auxiliaries. In view of this fact, and also because a precombustion-chamber engine must be spun rather rapidly to insure initial firing, it was decided to provide the engine with a 15-hp. two-cylinder, four-cycle starting engine driving to the flywheel of the main engine through a clutch and gear reduction which is disconnected automatically. On the six-cylinder engine this power starter is provided with a two-speed reduction gear, the larger reduction ratio being used to break the engine loose and "motor" it for some little time, until it becomes free enough to turn over in the high reduction gear. Besides making it possible to crank the engine indefinitely, this system has the advantage that in cold weather it makes it possible to transfer exhaust and cooling-water heat from the start-

ing engine to the main engine. In extremely cold weather it is necessary to motor the Diesel engine for some time before turning on the fuel, and, besides, a suitable grade of low-viscosity crankcase oil should be used. In Canada, a three-cylinder engine was started in 30 deg. below zero, but it took 25 minutes to do it.

Persons with experience on gasoline tractors are readily trained to operate

the Diesel tractor. As regards the life of the fuel apparatus, much depends on the care with which it is handled. There is no reason, Mr. Howard said, why these parts should not be in satisfactory operating condition after 5000 hours of use, if given reasonable attention. A set of pumps removed from a tractor operating on the Mississippi levee had worked 8200 hours without having been touched.

Requirements of Tractor and Industrial Power Plants Are Discussed by Staley

REQUIREMENTS of tractor and industrial engines were discussed in a paper by A. C. Staley of the Chrysler Corp., the author emphasizing that his object was to stimulate open discussion rather than to stress personal opinions or to fully develop some special subject.

The trend toward mechanical or electrical starters for tractor engines was

commended as logical by the author, who said it was too much to ask the average operator to hand-crank heavy engines. While storage batteries still are being looked upon with disfavor in commercial operations, owing to their failure when not properly taken care of, there is a decided moral obligation
(Turn to page 534 please)



Fowler McCormick

Three Ideas of Utopia

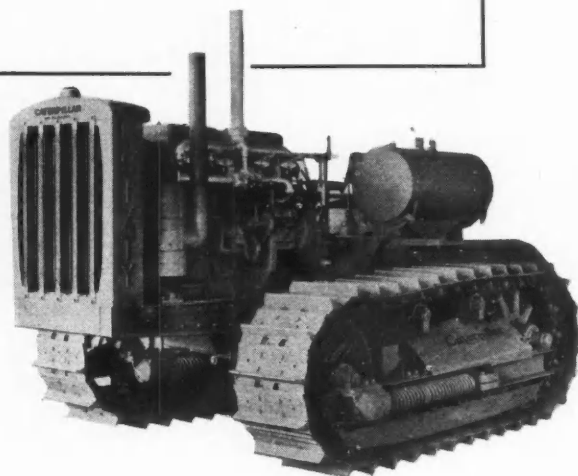
The salesman's—Prices below competition, a special product to fit the needs of each buyer, and a sufficient quantity of goods at the time they are wanted.

The production man's—The production of identical units at a uniform rate uninterrupted by changes in design which make manufacturing discontinuous.

The engineer's—To be able to design the best product possible for each purpose regardless of how much such a product would cost to produce, or whether the design was adapted to efficient manufacture.

—adapted from a paper presented at the S.A.E. Tractor and Industrial Power Meeting by Fowler McCormick, International Harvester Co., on the Relation of Engineering to Manufacturing and Distribution in the Farm Implement Industry.

Diesel power cuts tractor fuel costs 75 to 80 per cent, H. H. Howard pointed out in his SAE Meeting paper, offsetting the higher initial cost of the compression-ignition engine



Diesel Operating Results Justify Making Higher Initial Investment

STRIKING evidence of the popularity of Diesel power among buyers of track-laying tractors was presented by H. H. Howard of the Caterpillar Tractor Co. in a paper entitled "Some Diesel Tractor Problems," which he presented at the S.A.E. Tractor and Industrial Power Equipment Meeting, held in Milwaukee last week. In the sizes in which his company offers compression-ignition engines, Mr. Howard said more than 90 per cent of the demand was for Diesels and more than 2500 tractors equipped with this type of power plant have been sold during the 2½ years Caterpillar has been offering it.

Diesel-engined tractors at present cost slightly over 30 per cent more than equivalent gasoline tractors (\$6,500 for a 75-hp. chain-track Diesel tractor as compared with \$4,750 for a 70-hp. gasoline tractor; \$4,500, as compared with \$3,400 for 50-hp. tractors, and \$3,150, as compared with \$2,400 for 35-hp. tractors), and this difference in first cost, Mr. Howard pointed out, must be justified by the higher operating economy of the Diesel. In most track-type tractor work the load factor is between 50 and 60 per cent, and this relatively low load factor is entirely in favor of the Diesel, which maintains its fuel economy much better at reduced load. The fuel consumed in doing a certain job is usually about 50 per cent less in the case of the Diesel, and the saving

on fuel cost amounts to between 75 and 80 per cent.

On a Mississippi levee construction job cited by Mr. Howard, where gasoline costs 14 cents and Diesel fuel 4½ cents per gallon, the daily fuel costs were \$16.95 and \$2.97 respectively, equivalent to a saving of \$13.97 per day and \$2,095.50 for a year of 150 working days. The subject of the relative cost of fuel and oil for a Diesel and a gas tractor was further illuminated by tabulated results of tests made at the Montana Experiment Station. In these tests, in which a Caterpillar Diesel 50 was operated on the 3000-acre farm of the station for 616.15 actual operating hours in one year, it saved just over \$700 on fuel, according to the record.

By standardizing on a single cylinder size, 5¼ x 8 in. with a 15½ to 1 compression ratio, for the three, four and six-cylinder engines which the company installs in its different size tractors, research has been simplified, manufacturing economies effected and field service facilitated. Engines are of the four-cycle, solid-injection, precombustion-chamber type. The compression pressure is 525 lb. per sq. in. and the maximum combustion pressure, 725 lb. These are moderate pressures, and, so far, no engines have blown up or been broken up, nor have there been any cases of high maintenance expense that could be traced to high gas pressures.

Engine and Fuel Tractor and

Fuel injection pumps and valves are made interchangeable, and field adjustment, calibration and timing of these units is entirely eliminated. Any valve or pump can be installed on any cylinder of any engine, and these units are being kept in stock by dealers. Worn units are replaced by new ones on a flat-rate basis. Through the experience gained in servicing these tractors, a number of changes have been made in the valve and pump that resulted in improved performance.

Putting a new pump or valve on an old engine is said not to unbalance the engine. At first it was thought that the power outputs of individual cylinders would have to be checked from time to time, and the early engines were provided with exhaust-manifold plugs to accommodate a portable pyrometer for determining the exhaust temperature. But this proved entirely unnecessary.

Instruction books contain simple instructions for testing the complete fuel system. By jacking each pump individually by hand, the operator can quickly determine the condition of the system. A complete set of pumps and injectors on a six-cylinder engine can be installed in half an hour, and as these parts are kept in stock by dealers, serious delays are rarely occasioned by fuel-system troubles.

The chief difficulty in connection with fuels has been sufficiently to impress users that they must use a fuel that is heavy enough to assure proper lubrication of the pump, and to keep the fuel clean. Education, however, is solving the problem. In this connection the author pointed out that the automotive Diesel engine must not be allowed to become unduly sensitive with respect to the fuels that it will burn satisfactorily, as special fuels usually are expensive, and this would rob the Diesel of part of its advantages. The self-ignition temperature is of little importance, as far as the author's experience goes, with engines operating at up to 1000 r.p.m., for he has not yet found a fuel that such an engine would not run on.

Tractor engines usually are started only once or twice a day, and for this reason a sure start is much more important than a quick start. The use of any external source of heat (torch,

Fuel Problems Featured at Industrial Power Meeting

cartridge, punk, lamp) is undesirable, on account of the service requirements of these auxiliaries. In view of this fact, and also because a precombustion-chamber engine must be spun rather rapidly to insure initial firing, it was decided to provide the engine with a 15-hp. two-cylinder, four-cycle starting engine driving to the flywheel of the main engine through a clutch and gear reduction which is disconnected automatically. On the six-cylinder engine this power starter is provided with a two-speed reduction gear, the larger reduction ratio being used to break the engine loose and "motor" it for some little time, until it becomes free enough to turn over in the high reduction gear. Besides making it possible to crank the engine indefinitely, this system has the advantage that in cold weather it makes it possible to transfer exhaust and cooling-water heat from the start-

ing engine to the main engine. In extremely cold weather it is necessary to motor the Diesel engine for some time before turning on the fuel, and, besides, a suitable grade of low-viscosity crankcase oil should be used. In Canada, a three-cylinder engine was started in 30 deg. below zero, but it took 25 minutes to do it.

Persons with experience on gasoline tractors are readily trained to operate

the Diesel tractor. As regards the life of the fuel apparatus, much depends on the care with which it is handled. There is no reason, Mr. Howard said, why these parts should not be in satisfactory operating condition after 5000 hours of use, if given reasonable attention. A set of pumps removed from a tractor operating on the Mississippi levee had worked 8200 hours without having been touched.

Requirements of Tractor and Industrial Power Plants Are Discussed by Staley

REQUIREMENTS of tractor and industrial engines were discussed in a paper by A. C. Staley of the Chrysler Corp., the author emphasizing that his object was to stimulate open discussion rather than to stress personal opinions or to fully develop some special subject.

The trend toward mechanical or electrical starters for tractor engines was

commended as logical by the author, who said it was too much to ask the average operator to hand-crank heavy engines. While storage batteries still are being looked upon with disfavor in commercial operations, owing to their failure when not properly taken care of, there is a decided moral obligation

(Turn to page 534 please)



Fowler McCormick

Three Ideas of Utopia

The salesman's—Prices below competition, a special product to fit the needs of each buyer, and a sufficient quantity of goods at the time they are wanted.

The production man's—The production of identical units at a uniform rate uninterrupted by changes in design which make manufacturing discontinuous.

The engineer's—To be able to design the best product possible for each purpose regardless of how much such a product would cost to produce, or whether the design was adapted to efficient manufacture.

—adapted from a paper presented at the S.A.E. Tractor and Industrial Power Meeting by Fowler McCormick, International Harvester Co., on the Relation of Engineering to Manufacturing and Distribution in the Farm Implement Industry.

Are Motor Trains an Automotive E

PHILADELPHIA — The demand for single railcars having practically vanished, the call today is for rail motor trains, C. O. Guernsey, chief engineer of the J. G. Brill Co., told the April meeting of the local section of the S. A. E.

Such trains, he continued, are powered with Diesel engines of moderate speed and resemble the stationary more than the automotive type of engine. S. A. E. standards are not applicable in the design of such engines and of motor trains generally. The electrical portion of the equipment is designed in accordance with the standards of the A. I. E. E., and the car proper conforms to the standards and recommended practices of the A. S. T. M. and the Master Car-Builders Association.

In view of these developments tending to move the motor train out of the field of automotive engineering, Mr. Guernsey considered it rather strange that the S. A. E. recently had broadened its truck and bus activity to include railcars. In the discussion, this implied suggestion that the S. A. E. drop the railcar activity met with vigorous objection from A. K. Brumbaugh, vice-president of the society representing the truck, bus and railcar activity. He contended the automobile industry had been largely responsible for

the railroads losing an important part of their former traffic, and expressed the opinion that the S. A. E. might be of help to the rail carriers in recouping some of their losses.

After sketching the early history of railcars, Mr. Guernsey said that a new era in railcar development set in after the war. From 1921 to 1926 there was a close connection between the railcar and motor vehicle industries, because the engines used for railcars generally were of the automobile type, and such problems as those of carburetion, ignition and cooling were the same. Still, the major part of the work of railcar construction was a car-builder's job. As the cars grew further in size, the relation between railcar practice and automobile practice ceased almost entirely.

From the passenger's standpoint, Mr. Guernsey stated, the use of individual cars is preferable to that of trains, because the frequency of service can then be a maximum; but actually it is impractical to run individual cars on main lines, because of their interference with freight trains. A railcar traveling at 70-80 m.p.h. could cover a distance of 250 miles in four hours. In going that distance it would have to overtake three or four freight trains. While these trains were being passed

they would be standing idle on the sidings, and the consequent loss would be very heavy.

Three-car trains probably are the smallest economical units for main-line service, and both the Budd train for the C. B. & Q. and the Pullman train for the Union Pacific are of that type. However, the Pullman company already is building a six-car train of 900 hp. and a nine-car train of 1200 hp. In the discussion of this question it was also brought out that a train of several cars requires little more power to propel it than a single car, because at high speeds a very considerable item in the resistance to motion is the air resistance, which depends on the forwardly projected area, and this is no greater for the train than for the single car.

While speeds of 110 m.p.h. have been mentioned in the newspapers, Mr. Guernsey thought speeds of 70-80 m.p.h. were what the railroads had actually in mind. (Col. E. J. W. Ragsdale mentioned in the discussion that 102.5 m.p.h. had been recorded in the tests of the Burlington train.) These trains are not for local service but for runs between some of the larger cities, and very few stops will be made en route. The Burlington train, for instance, is intended for service between Lincoln, Neb., and Kansas City, a distance of 250 miles, which it will cover in 4 hours. With these trains the emphasis is shifted from minimum cost to ability to attract passengers.

Discussing some of the features of design of modern motor trains, Mr. Guernsey mentioned the high cost resulting from the extensive use of stainless steel and aluminum, and that of the large Diesel engine, the electrical equipment, and the many luxurious appointments. While admitting that such construction might be justified under certain conditions, for general use there should be less luxury, he thought. Passengers might appreciate these features of luxury, but they would be loath to pay for them. The best bait for railroad passengers still was a low fare.

It was brought out at the meeting that one of the special problems in-



e Engineering Job?

C. O. Guernsey tells Philadelphia Section relation between railcar design and automotive practice has almost entirely vanished



C. O. Guernsey

involved in the development of a high-speed motor train is that of brakes which will bring the train to a stop safely from a speed of 90 m.p.h. in the same distance that a steam train can be stopped in from 60 m.p.h. (the present approximate maximum.) If the braking power of high-speed trains were less than this, it would be necessary to rearrange the signal system. The maximum deceleration obtainable depends upon the adherence between wheels and rails, which varies from about 0.08 to 0.3, the latter being the coefficient of static friction. It would not do to apply the

brakes to the locking point while the train is traveling near maximum speed, and for this reason the power cylinder of the air brake is provided with an inertia-controlled valve which allows the air to escape if the engineer applies the brake too rapidly.

Mr. Guernsey thought it curious that so much effort should be spent at present on single railcars of the lightest possible construction. Safety is a prime requirement. American railroad equipment is heavier than European, but the safety record of American railroads justifies the

heavier construction. He considered it very doubtful whether it was justified to go to extremes in weight reduction and thought that eventually the best compromise between the proved past and present radical design would be accepted.

Beryllium Bearing Steels Shown Unsuitable for Engine Parts

The effect of the addition of beryllium to steel has been investigated in England through the cooperation of the research departments of English Steel Corporation, Ltd., and Thomas Firth and John Brown, Ltd., at the solicitation of the Air Ministry. A report on the results obtained was made at a meeting of the Iron and Steel Institute, by J. H. S. Dickenson and Dr. W. H. Hatfield. Metallic beryllium of 98 per cent purity was supplied by the Air Ministry for the tests.

The investigation was planned to have a limited and severely practical scope, the object being to determine whether the addition of beryllium to selected specific types of steel, largely used in aircraft and engine construction, was likely

to offer any direct benefit, by improving the physical characteristics.

The results disclosed in the course of the investigation indicated that there was little or no prospect of the element becoming a useful addition to the group of metals used in the manufacture of special steels. Beryllium is extremely expensive and is unlikely ever to become reasonably cheap, while its lightness and readiness to oxidize made the actual introduction into molten steel somewhat difficult and distinctly wasteful. As regards forging, the addition of 1 per cent of beryllium tends to make some of the steels, particularly the 3½ per cent nickel and the nickel-chromium steels, distinctly "stiffer" under the hammer, with an in-

creased tendency to "burst," especially towards the top end.

In this respect, however, the addition of beryllium proved harmful rather than otherwise. Apart from a hardness peak in the tempering range, 750-830 deg. F., and the associated brittleness and the liability to crack with rapid cooling, probably due to some pronounced volume change, the beryllium-bearing steels showed throughout a marked liability to fragility, as evidenced by the impact test, which far outweighed the increase in tensile strength. In short, none of the steels containing beryllium showed, with any treatment, the necessary combination of high elastic limit and fatigue resistance with ductility and toughness.

The Forum

10-W and 20-W Lubricants Expected to Obsolete S.A.E. 10 and 20 Oils

Editor AUTOMOTIVE INDUSTRIES:

In the March 31, 1934 issue of *Automotive Industries* on Page 414 there is a correction in reference to the write-up of the talk which I gave at Philadelphia. This write-up was published in the March 17, 1934 issue of *Automotive Industries* on Pages 334 and 355.

The lantern slide used in my Philadelphia talk specified that the car driven by Ab Jenkins was a Pierce Arrow. In my talk I may have referred to this car as a Studebaker since I knew that at that time the Pierce Arrow Company was owned or controlled by Studebaker.

The heading and the last sentence in the correction in the March 31, 1934 issue of *Automotive Industries* somewhat disturbs me. The oil used in this test was Pennzoil. Pennzoil is a Pennsylvania base oil and the particular Pennzoil used by Ab Jenkins met both the S.A.E. 20 and the 20-W classifications. It is probably true that the oil which was purchased for use by Pierce Arrow in the Salt Lake tests was labelled S.A.E. 20 and that it probably did not also carry a 20-W label. This is on account of the fact that the 20-W classification was approved for use and trial at the meeting of the S.A.E. Lubricants Sub-Division held in Chicago on June 28, 1933. We are informed by Mr. Cummings, of the local Pennzoil warehouse, that at the present time this grade of oil is marketed in tin cans that are stamped in raised letters on the lid, "S.A.E. 20," and that the cases in which these cans are packed are marked, "20-W." I believe that a number of other companies are following this same practice until their present stock of cans is exhausted. Their filling station attendants and salesmen are, of course, instructed that this particular grade of oil meets both the S.A.E. 20 and 20-W classifications. Some companies, if their oil meets both classifications,

are stamping both numbers on the can. This practice is being followed by the Sinclair Oil Company, for example.

I have a letter from W. S. Zehrung, Manager of Lubricating Sales of the Pennzoil Company, dated Dec. 15, 1933, in which he writes as follows:

"As a matter of fact, in the advertising which has been scheduled for January, we propose making the statement that our Pennzoil S.A.E. 10 and S.A.E. 20 fully comply with the 10-W and 20-W requirements of various groups of automotive engineers. I don't know the exact form that this statement will take, as it's in the hands of our agency, but it will be along this general line."

In the Nov. 4, 1933, issue of *Automotive Industries* on page 550 you have a write-up explaining the 10-W and 20-W, telling in what ways these oils may be the same and in what ways they may be different. You point out that the "S.A.E. 20 and S.A.E. 10 oils are classified in accord with their viscosity or fluidity at 130 deg. F." while "the new 20-W and 10-W oils are classified in accord with the viscosity or fluidity at zero deg. F. or, in other words, are classified in accord with their ability to permit easy starting within the temperature range for which they are recommended." In this same article you also point out that "many of the S.A.E. 10 and S.A.E. 20 oils fall within these classifications and may be used as 10-W and 20-W." In this same issue of *Automotive Industries*, on page 560, you have a report of the meeting at the American Petroleum Institute and you again discuss these 10-W and 20-W oils in reporting the paper by W. H. Graves of Packard.

The petroleum industry, on account of the fact that it markets oils made from different types of crudes and made by different manufacturing methods, has a tendency to stress certain sales arguments that

may be construed to favor their particular product. The 10-W and 20-W classifications make it possible to match the oils in regard to their starting ability regardless of the crude or method of manufacture. The advocates of the paraffin- or Pennsylvania-base oils claim that although oils from any other crude may be made to have the same starting characteristics as their oils, yet their oil will have a higher viscosity at high temperatures and as a result they claim that the car owner will obtain somewhat higher miles per gallon of oil when the car is driven at high speeds and high temperatures. The advocates of the mid-continent and naphthene-base oils, while admitting that it is possible to obtain the same starting characteristics with oils from paraffin base, claim that their oils of lower viscosity will give increased gasoline economy, and that the increase in gasoline economy resulting from the use of lower viscosity oils will more than offset the cost of the additional lower viscosity oil used. Of course, to make these claims more accurate from a scientific standpoint, the advocates of each of these oils should admit the weaknesses of their individual oils as well as stressing their strong points, but somehow or other it appears that salesmen in general are rather quiet about emphasizing weaknesses of their particular product.

In view of the misunderstanding on the part of the person or persons who asked you to make the correction in regard to 20-W oil having been used in the Pierce Arrow, it might be desirable for you to call attention to this entire subject of winter starting in one of the later editions of *Automotive Industries*. It appears that, regardless of the large amount of publicity which we have tried to get out on this subject some of the automotive engineers are still somewhat confused as a result of the conflicting claims that have been made in the past by advo-

cates of the different kinds of lubricating oils.

We are particularly anxious to have this whole matter cleared up before the June meeting of the S.A.E. for the reason that at this meeting some action will be taken toward officially approving the use of the letters "S.A.E." in connection with the classifications 10-W and 20-W. The probabilities are these oils will be known after the summer meeting as "S.A.E. 10-W" and

"S.A.E. 20-W." It is my belief that the present S.A.E. 10 and S.A.E. 20 will become obsolete, but whether or not S.A.E. 10 and S.A.E. 20 will be repealed at the June meeting or even for several years is a question. It is necessary to make changes slowly where very large commercial interests are involved, as in the case of the proper oils for winter starting.

H. C. MOUGEY
Chief Chemist
Research Division.

Engine Indicators—The Work of Professor Trowbridge

Editor AUTOMOTIVE INDUSTRIES

On page 102 of *Automotive Industries*, Vol. 70, No. 4 (January 27, 1934) is shown a cut Fig. 1—Pressure element of M.I.T. indicator, and the first paragraph of the article opens with "A new instrument . . . etc." The wording is unfortunate, since it implies that a new method of indicating has been developed. This idea is further strengthened by "The basic element of the new instrument is the pressure element (Fig. 1) which can be screwed into a spark-plug hole. It comprises a small diaphragm exposed to cylinder pressure, whose motion is imparted to a coil of wire which moves axially in a radial magnetic field."

The basic idea of so using a coil and stiff diaphragm is not new. In the *Transactions of the Society of Automotive Engineers*, Vol. 17, Part 1, 1922, Professor Augustus Trowbridge of Princeton University has an article "Photographic Recording of Engine Data." Trowbridge shows the unsuitability of the old pressure-volume card for combustion study, and also shows that plotting of the slope (dp/dt) of the pressure time diagram vs. time results in a diagram which can be more accurately interpreted. After developing this new form of card, he states, "It is

easy to construct an indicator that will record the rate at which the pressure is varying instead of recording the pressure itself. An indicator in which a very stiff steel diaphragm is the moving part can be made so that the diaphragm

moves in step with the pressure exerted upon it, and introduces no vibrations peculiar to itself. If a small bobbin of fine wire be mounted rigidly on the diaphragm so that in its motion it cuts a radial field of magnetic force, an electro-motive force is induced that is in step with the velocity of the bobbin; that is, with the time-rate of variation of the pressure exerted on the diaphragm that supports the bobbin." Fig. 8 and Fig. 9 of the article show (dp/dt) vs. t cards taken by such an indicator. A special camera was used for recording the deflections of a modified Einthoven galvanometer.

The M.I.T. indicator differs by using amplification of the induced current and a different oscillograph. Likely the mechanical construction of the pressure element varies considerably from that used by Trowbridge, but the underlying principle is the same.

In view of the statement in your article, "and it is believed that it can be developed into a pressure indicator, which would necessitate the development of a circuit that would integrate the rate-of-pressure-change curves," it is interesting to remember that Trowbridge developed his indicator to avoid differentiating a pressure-time curve.

ARTHUR B. DOMONOSKE

Causes of Increase in Oil Consumption With Car Speed

Editor, AUTOMOTIVE INDUSTRIES:

Mr. Mougey in his recent S.A.E. paper gave some interesting data on the effect of car speed on oil consumption, citing an average ratio of 6.9 or 590 per cent increase in oil consumption for an increase of speed from 30 to 55 mph. This figure agrees closely with observations made by the writer.

It is possible that this large increase in consumption may be traced to the crankcase ventilation systems which have been incorporated in engine design in recent years. At high speeds with some designs, a considerable volume of air is drawn through the case, carrying with it considerable amounts of oil mist or

vapor.

Perhaps the very great variation of consumption increase with speed increase noted by Mr. Mougey may be due to variation in effect of the ventilation systems in different designs. The fact that oil is lost in this manner is easily verified by examining the outlet or vent pipe of the ventilation system.

In view of this possible solution a discussion of the pros and cons of crankcase ventilation in the Forum might be of interest, especially as the subject of oil consumption at higher speeds becomes more important as the average cruising speeds increase.

ALBERT H. DEIMEL

Engine and Fuel Problems Featured at Tractor and Industrial Power Meeting

(Continued from page 529)

on the part of the builder to protect the life and limb of the operator, however humble he may be.

Provisions for cylinder cooling are of great importance in an engine intended for heavy duty, and this point was illustrated in the paper by the citation of a case where the introduction of cooling water at the bottom of the jacket resulted in piston seizure in a new and moderately tight engine when started up and put on full load during cold weather. Even with thermostatic control, the water returning from radiator was cold and tended to shrink the cylinder bores at the lower end of the jackets, making them taper and causing seizure of the pistons when at the lower end of the stroke. This was eliminated by bringing the water in as close to the top of the cylinder barrel as possible, so that the jacket had natural circulation, enabling the barrels to warm up quickly even though the heads are running quite cool.

Crankcase ventilation is essential to good performance and long life of engines. In the case of engines on low-speed vehicles such as tractors, it is difficult to obtain sufficient air velocity to effect proper crankcase ventilation, and it is then necessary to connect the crankcase breather to the inlet horn of the carburetor. This calls for some provision against oil entering the engine cylinders with the air breathed.

It is difficult to build an industrial engine having all the required accessories, such as governor, magneto, water pump and generator, with less than four to five gears in the driving train. On large engines with long crankshaft it is difficult to make such a gear train silent, and torsional vibration dampers for such installations are difficult to develop.

In industrial installations it is often difficult to remove the oil pan, owing to the proximity of the machine structure. In such cases adequate openings through the sides of the crankcase, permitting of inspection and repair of the bearings, are very helpful.

Mr. Staley said it was difficult to secure good carburation in engines requiring carburetors of over 2-in. size, as these carburetors have not been developed to the same state of perfection as the smaller sizes currently mounted on passenger-car and truck engines.

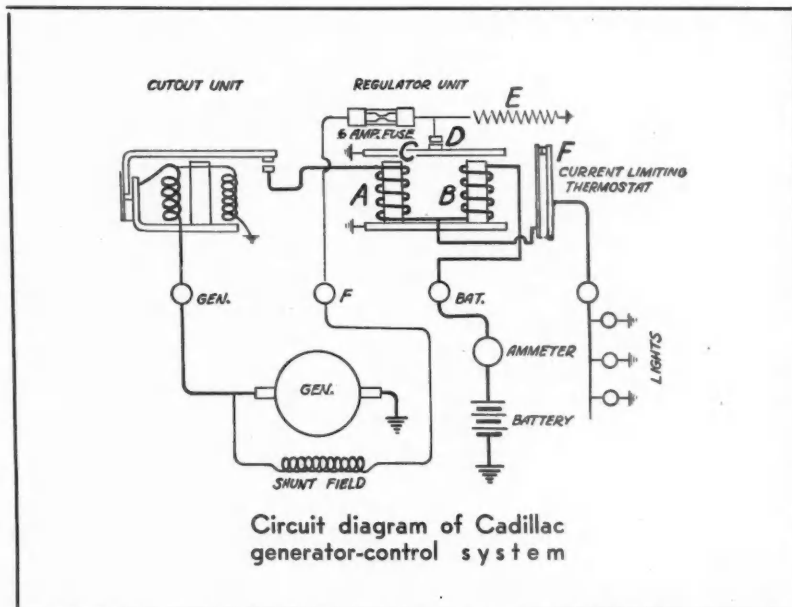
A comparison of the principal features of carburetor-type heavy-fuel engines and Diesel engines was made in the paper. Development of both types of engine has been handicapped somewhat, the author said, by a lack of

knowledge of fuels available and their economic and technical characteristics, and to remedy this, the Tractor Fuels and Lubricants Sub-committee of the S.A.E. Tractor and Industrial Power Subcommittee sent out questionnaires to representative oil companies and engine manufacturers and users. The questions and a summary of the replies received to date were given by the speaker.

The economic aspects of the use in farm tractors of fuels other than commercial gasolines were discussed in a paper by R. E. Wilson and D. P. Bar-

nard of the Standard Oil Co. (Indiana). Several new fuels have been placed on the market during the past year or two. Of these, liquefied commercial butane gas appears to be the most interesting at this time. The authors, however, came to the conclusion that from the work thus far done, the use of butane and other non-orthodox fuels does not appear attractive from the economic viewpoint, when considered for such small units as farm tractors, and this in spite of the fact that fuel cost amounts to about one-third the total operating cost of these units.

1934 Cadillacs Have New Methods of Generator-Output-Control



The above circuit diagram shows the lamp-load-control, constant-current system employed on the Cadillac this year. A magnetic vibrator D, operated by generator output current, alternately cuts in and out the shunt-field resistance E. The vibrator has two coils. Battery-charging current flows through both coils, while lamp current flows through coil A only and therefore it takes twice as much lamp current to produce the same effect on the regulator as a given battery-charging current. The result is that the generator delivers more current when lamps are turned on than otherwise. The regulator also comprises a thermostatic switch which limits the current flow in the event of a short circuit in the lighting line

Sloan Urges Industry to Stand and, if Necessary, to Fight for a Square Deal

(Continued from page 523)

mutual confidence of management and labor which, irrespective of what any one may say, has provided the American nation, and particularly the American worker, with the highest standard of living the world over, justify a decision in favor of union domination? Does the history of such industries in America as are dominated by the closed shop, indicate that that is the route we should follow? I contend that it does not, and I am confident that the American workman will decide that it does not. On the other hand, we have before us pending legislation which contemplates by edict of law, requiring the American workman, as a price for his job for his means of existence, to become a member of a national union and to pay dues to that union, an organization without any legal responsibility whatsoever, free to use the tribute that it thus exacts from the American workmen and with its added burden on American industry, in such ways as it alone sees fit, without accounting except to itself.

Many of us are asking ourselves, and others interested in industry: What about the so-called regimentation of industry? What are the implications as to the future of the grouping together of different units of industry through the instrumentality of the so-called Code? Is Industry in the future to be under the domination of Government with its efficiency and effectiveness circumscribed through the influence of the political consideration? Is the initiative and aggressiveness that we all feel as contributing so outstandingly to the development of America to become a thing of the past? Are the programs to which we have so patriotically subscribed, to be, in fact, emergency measures, or will they as they stand now, or through modification, be carried forward as a permanent part of our industrial system?

It seems to me that we should first answer one question—with the return to a more normal level of industrial activity, will some form of stabilization be found essential? Will the competitive urge be so destructive in its influence on our social and economic structure as to

necessitate such a consideration? If we proceed in this direction, ways and means must be provided whereby the equities of the consumer and the equities of the worker—necessary parties to such a proposal—can be established and maintained. Is it possible to develop a procedure that will make industry self-governing in fact, at the same time protect the equities of all concerned? Does there not loom in the shadow of this consideration the spectre of Government regulation with the implication, through evolution, of Government management of industry with its stifling influence on our progress? Can any result justify the payment of such a price, actual or implied? Does any one believe that Government and politics can be separated?

I cannot see clearly enough as yet to establish my own answer. I am convinced that whatever the answer may be in some industries it is most emphatically negative in others. This suggests the undesirability of forcing on all branches of industry something that may be desirable only for some. If we had had the wisdom and restraint to apply our remedies on a specific rather than on a blanket basis, would we not have been better off? Had we set up only a few experimental codes, carefully adapted to the special considerations existing in those industries where competition was really out of hand, or other destructive conditions existed, should we not have formed the basis for a much more substantial and a much more assured recovery?

We simply have not gone far enough to see, with sufficient exactness, what we ought to do and what the outcome is likely to be. As economic recovery proceeds; as employment expands; as the future becomes more and more assured; as confidence becomes more and more reestablished, it is inevitable that we will demand, and let us have the courage to demand, what we have always enjoyed; what we believe in, and what has made us what we are—the greatest possible freedom of action to exercise our initiative to capitalize to the fullest degree, our opportunity and the resources of our great country—all with a minimum of essential restrictions.

On the other hand, we must not fail to appreciate the implications of our ever-changing economic machinery, with its continually increasing complications. Therefore, it would be a colossal mistake if we should lose an opportunity of improving our industrial mechanism by failing to intelligently evaluate those things that bid fair—after an open-minded, unprejudiced and non-political evaluation—to justify us in believing that, for the long time pull, they will contribute to a better order of things. Let us not forget that there is a very distinct obligation on us to think and act more intelligently in the future than we have at times in the past.

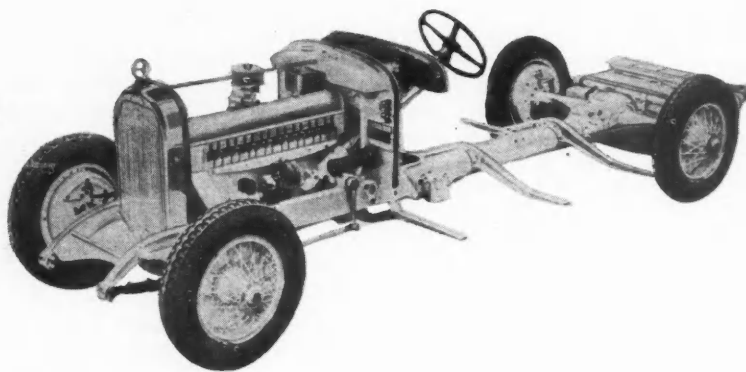
Unfortunately there is great danger of charging industry with shortcomings which do not exist or for which it is not responsible and of forcing, through prejudice, ignorance or from the standpoint of the political consideration, uneconomic measures through the instrumentality of law or otherwise, which will tend to limit the ability of industry to develop, and to contribute more importantly, to the well-being of all. No one can deny the fact that wealth is created and only created through the instrumentality of industry—it certainly cannot be created through the instrumentality of Government. The more intelligent the direction of industry, the more openminded with respect to its social responsibilities, the less need it be circumscribed by unnatural restrictions; the more should it be permitted to exercise the widest possible initiative; the more will progress be promoted, and the more rapidly will we achieve our objective—the well-being of the American worker.

Irrespective of the past and looking at the present and toward the future, it is of vital importance that industrial management should more effectively and courageously stand and, if necessary, fight for those things which are just and equitable—those things that will enable it to more effectively discharge its tremendous responsibilities to the public welfare, and contrariwise, courageously stand and aggressively fight against any and all proposals that affect it adversely and unfairly.

Car Design Trends Call for New Deal in Chassis Construction

(Continued from page 520)

Austro - Daimler backbone - type independently-sprung car



for instance, the 30.5-cu. in. Standard-Superior of Ganz won the world's speed record for its class over 50 miles at a speed of very close to 80 m.p.h. on the Montlhery Speedway. Other remarkable constructions are those of Tjaarda, Martin and Porsche.

The observer on the sidelines is likely to ask,—“If the streamlined, rear-engined car offers all these advantages of simplicity of design, low weight, high fuel econ-

omy, and great roominess, why was it not adopted long ago?” There may be other psychological and technical reasons, but there seem to be two main factors that have prevented its adoption so far: The lesser one probably was the fear that the public would refuse to accept this fundamental change; the more important one, the difficulty of building a streamlined body around a chassis of rather poor functional design.

The drawing on page 519 shows the outlines of two streamlined bodies, one put on the orthodox chassis, the other on a tubular backbone chassis with the engine at the rear. Whereas the latter permits a perfect streamline body, the orthodox chassis produces a distortion of the streamline shape, as the high frame with the engine in front necessitates the placing of the back seats high over the rear axle.

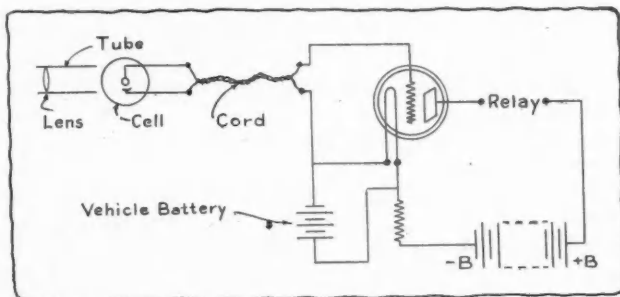
Photo-Cell Indicators on Motor Trucks

It will shortly become obligatory in France, we are informed by Major R. Raven-Hart, for all heavy motor vehicles to be fitted with a device warning the driver when another vehicle desires to pass him. One such device has already been adopted by the Police Department of Paris for its own heavy automobiles. This consists of a photoelectric cell fitted at the rear of the car, which, when an overtaking automobile switches on its headlights, actuates a relay through an amplifying tube. The cell used is an all-metal selenium cell of a very robust type, connected to the amplifier, etc., by a long, flexible cord, and therefore removable at will to the tail of the trailer when this is in use. It is screened by a protec-

tive tube and lens so as to be actuated only by a direct light and not, e.g. by the normal variations of lighting between sunlight and shadow. The amplifying tube takes its filament current from the vehicle battery, but has its own B battery. Any form of indicator de-

sired, visual or audible, can, of course, be fitted to the relay. All that will be necessary, therefore, is for the overtaking automobile to switch on its headlights for a moment when approaching the truck by day, and by night not even this action will be required.

Diagram of the hook-up as described by Major Raven-Hart



Soviet Automotive Output Runs Ahead of Program

ACCORDING to the latest copy of the Economic Review of the Soviet Union, production in the automobile and tractor industries of the Union for the first 11 months exceeded the figures set in the program for the whole year 1933. The output of automobiles totaled 44,953, or 2.1 per cent above the enlarged plan for 11 months. Of these trucks made up 36,167 and passenger cars 8,792. The output of trucks by the Stalin (Amo) and Molotov (Gorky) plants was 20,011 and 14,273, respectively. The passenger cars are produced at the Gorky plant and larger trucks at the Yaroslavl plant.

Tractor output for the 11 months was 1.2 per cent above the program. The total output amounted to 65,782 machines, of which 36,204 were produced by the Stalingrad tractor plant and 28,285 by the Kharkov factory. The remainder (1,293 tractors) were produced in the recently completed Cheliabinsk works. The output of tractors in the 11-month period was 64.1 per cent above that of the corresponding period in 1932.

All-Year Driving Cuts Seasonal Variation of Gas Consumption

In an article on "Changes in Seasonal Gasoline Consumption," by Joseph E. Pogue in *Mining and Metallurgy*, it is shown that the seasonal fluctuations in the sale of gasoline are decreasing, from which it is perhaps legitimate to draw the conclusion that automobiles are being used more uniformly the year around. During the period 1918-1922 the consumption of gasoline varied from 71.7 per cent of the monthly average for the year in January to 128.4 per cent for August. During the five-year period 1923-1927 the consumption varied between 79.6 per cent in February and 120 per cent in August, and during the five-year period 1928-1932 it varied between 78.5 per cent in January and 114.8 per cent in August. In 1933 the demand varied between 81.6 per cent in January and 112.7 per cent for both July and August, and Mr. Pogue forecasts that the range in proportional consumption will be from 82 per cent in January to 112.6 per cent in August.

BUNDYWELD STEEL TUBING

Resists Vibration

Because of its ability to withstand vibration, its great strength, and recuperative properties, Bundyweld Tubing has been proven superior for such installations as gas, oil, brake, and vacuum lines. It has the strength of steel with sufficient ductility to permit easy fabrication.

Bundyweld Steel Tubing is rolled from strip steel which has been previously copper-coated on two sides, and is then Copper-Hydrogen-Welded into a solid structure.

The reducing atmosphere of the welding process leaves the tube absolutely clean and free from scale. It may be heat-treated without injury.

Both I. D. and O. D. are held to tolerances of .003". Uniformity of wall thickness is an outstanding feature. Bundyweld tubing is furnished in base sizes of $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{7}{16}$ ", $\frac{1}{2}$ ", and $\frac{5}{8}$ " in various wall thicknesses. It can be redrawn to any odd size required. Furnished in lengths of completely fabricated, either with or without fittings. Send blue prints or samples for quotations. Complete information upon request.

BUNDY TUBING CO.

DETROIT



W E HEAR MUCH about automobile proving grounds, with their hills and valleys, rough roads and smooth pavements, speedways and cobbled streets—of cars shoved off high cliffs or driven through deep water troughs. We hear little, however, of the less spectacular but equally important proving ground tests of materials, which must precede the tests of the finished car.

In the case of Bakelite Materials, for example, the "Proving Grounds" are extensive laboratories at Bloomfield and Bound Brook, N. J. In these laboratories every shipment of raw material, every run of processed product, samples of finished parts, are subjected to tests as exacting and exhaustive in their class, as any on the proving grounds of the motor car manufacturer.

It is these tests that safeguard the high quality, uniformity and dependability of Bakelite Materials—molded, laminated, and varnish—that has brought about their acceptance by the whole motor car in-

TESTING MOLDING MATERIALS BEFORE SHIPMENT (Right) Before going to the customer or into stock, each batch of material must pass rigid laboratory inspection, including molding tests made in the Inspection Laboratory's Press Room.



dustry. Our new editions of booklets 10M, Bakelite Molded and 10L, Bakelite Laminated, illustrate and describe the varieties of Bakelite Materials mentioned above.

We shall be glad to mail you copies promptly upon receipt of your request.

BAKELITE CORPORATION, 247 Park Avenue, New York, N. Y. 43 East Ohio Street, Chicago, Ill.
BAKELITE CORPORATION OF CANADA, LIMITED, 163 Dufferin Street, Toronto, Ontario, Canada

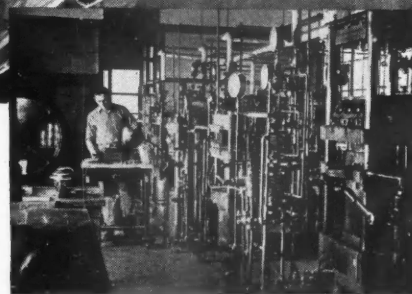
BAKELITE

The registered trade marks shown above distinguish materials manufactured by Bakelite Corporation. Under the capital "B" is the numerical sign for safety, or unlimited quantity. It symbolizes the safety number of present and future uses of Bakelite Corporation's products.

THE MATERIAL OF A THOUSAND USES

April 28, 1934

Automotive Industries



DEVELOPING NEW MATERIALS FOR SPECIFIC USES (Left) Constant research work is being carried on in the development of new materials for specific purposes and for the improvement in the technic of processing these materials.

ALL MATERIALS MUST PASS RIGID EXAMINATIONS (Below) All resins and varnishes, before being released for further Bakelite manufacture, must pass rigid examination in the Resin and Varnish Inspection Laboratory. Here thousands of experiments and tests are performed in the course of the year.

